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William Henry Fitten M.D.

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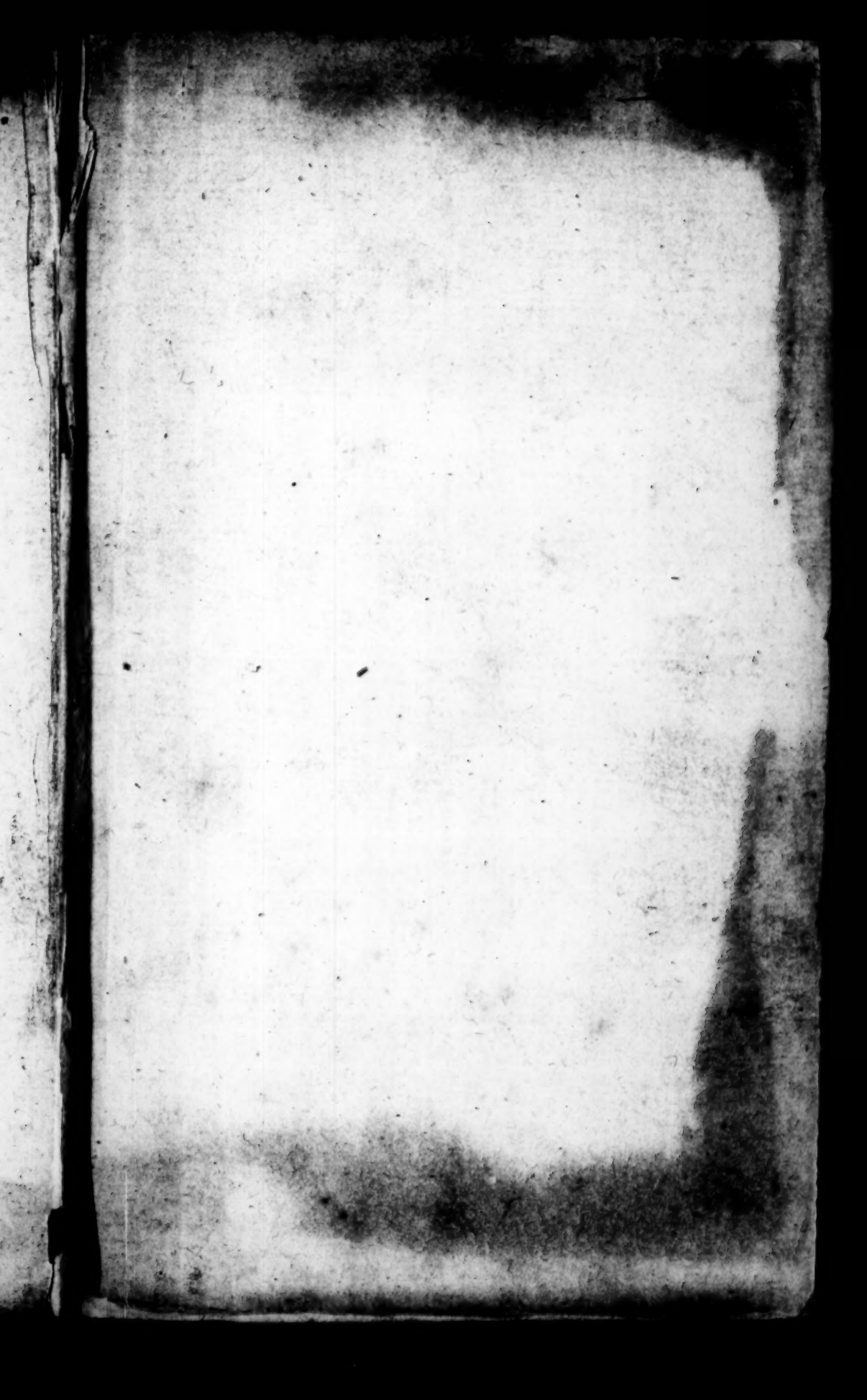
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William Henry Fitten M.D.

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AN
ESSAY
TOWARDS
ANATURAL,
Experimental and Medicinal
HISTORY
OF THE
MINERAL WATERS
OF
IRELAND.

WHEREIN

The several impregnating Minerals, being investigated by a Series of Experiments, each Water is reduced to its proper Class.

The Virtues of such as have been used are given from practical Observations.

Divers new Waters, especially of the Sulphureous and Vitriolic kind, are enumerated and more accurately described than hitherto.

The Whole illustrated with TABLES exhibiting a clear View of the Experiments in Concert,

AND

A Comparison of the *Irish* to the *English*, and other foreign Waters.

By JOHN RUTTY, M. D.

DUBLIN:

Printed for the AUTHOR. MDCCLVII.



TO
Dr. SAMUEL MADDEN,
THIS
E S S A Y
ON THE
MINERAL WATERS
OF

I R E L A N D,

In Testimony of Great Respect,

IS
I N S C R I B ' D,
BY THE

AUTHOR.

E R A.



PAGE iv. line 17, 18. ~~transcribe the~~ parenthesis, and let it be read (and equal, if not superior)

P. 19. line 10. *for Waters read Water.*

25. line 28. *after the word ascribed, for ; put ?*

34. line 3. *after three or, add the word four*

127. line 3. *for winters read winter*

200. line 2. *Read Of the Principles, Virtues and method of using the Chalybeate Waters.*

211, 212, 213. *Read in the Running Title, The Method of using Chalybeate Waters*

214. *In the Title for first, read particularly*

231. line 34. *for rod hot iron, read red hot iron*

287. line 22. *for Hewetson read Houston*

363. line 8. *dele congruous*

441. line 16. *for one read some*

451. line 5. *for obsorbent, read absorbent*

456. line 27. *for Kingsale, read Kinsale*

ibid. line 32. *for filled with, read contains.*

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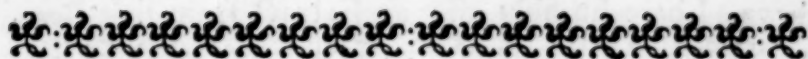
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T H E P R E F A C E.

AT a time when an affectation of the use of spirituous liquors greatly prevails among the inhabitants of a country, to the great prejudice of their health as well as morals, it seems to be not an unseasonable undertaking to recall to their observation and recommend to their use, Water, the original, natural drink of men, and as yet the only drink of most of those nations we call heathen, and indeed the most wholesome of all drinks, and the most universal Medicine in nature, and as variously impregnated and compounded by the Divine Wisdom, found more efficacious than all the productions of art in the cure of chronical diseases :

Wherefore, having devoted the leisure of twenty years and upwards to an enquiry into the nature, contents, operation and virtues of the Mineral waters of this country ; and making a Comparifon of them with the *English* and other foreign Waters, from a regular series of experiments of my own and those vouched by the best authorities, and from thence compiled *A General History, or Methodical Synopsis of Mineral Waters*, wherein the principles (a) of investigating the several Minerals impregnating each water are laid

(a) Some of the Principles of investigating the Mineral Contents are also laid down in the Observations annexed to the first Table in the present Work.

A

down,

The P R E F A C E.

down, I here humbly offer an Extract from that *General History* for the use of the inhabitants of this kingdom, with a more minute account of some of the waters peculiar to us than is contained in my larger work; and I apprehended it to be more expedient that this should be done rather by myself, than by any other person who might attempt it, but perhaps execute it less satisfactorily to me, if not to the public.

The *English* Physicians within these last hundred years have made great discoveries on this subject, and published accounts of their mineral waters, and frequently prescribed them to the great advantage of their patients, and there is scarce a country in *Europe* but has furnished the public with some account of its Mineral waters, whilst those of this Country have been in a manner entirely neglected, altho' the bounty of Providence has supplied us with no small number and variety of them, and those not less considerable for their virtues, as will appear in the following history.

It is true, we cannot boast of hot Baths, but with respect to other medicinal Waters which have amply recommended themselves by their good effects, we may vie with our neighbours: and first as to *Chalybeate waters*, we have perhaps as great a plenty and variety as any Country of equal extent in *Europe*, and some of these so strongly saturated that they might in a great measure supply the place of the *German Spa* water:

And indeed, about fifty years ago, before the present mode of drinking the *Spa* water prevailed, our own Chalybeate waters as well as our own Malt-liquors contented us, the first having been used, not only by gentlemen in the country situated near the wells, being conveyed to them in the cool of the morning and
drank,

drank, but also sent to remoter places, as particularly that excellent Chalybeate of *Dunnard* (the loss of which is to be lamented) was usually sent to *Dublin*, and sold for present consumption in medicinal uses.

It must be owned that the water of *Spa* challenges the preference to the far greater part of our domestic Chalybeates in point of keeping its original qualities at a distance ; but from the Observations made in the following History on some of these waters in the northern parts of this kingdom, particularly in the County of *Fermanagh*, I am strongly of opinion that were we as well provided with bottles, and as careful in filling and corking them as they are of theirs abroad, some of these might be kept for several months retaining their original qualities as at the fountain, and consequently be drank in *Dublin* and other remote parts in lieu of the *Spa* water : and even our lighter Chalybeates which do not otherwise bear carriage, but become effete at a small distance from their fountains, may, by mixing a small quantity of acid spirits with them, be preserved at least for several weeks for use, without injury to their virtues, the mineral particles being by this means kept suspended ; and thus at least the defect of the *German Spa* water, which we often complain of in summer in *Dublin*, might be supplied.

What I have said respects only the use of the Chalybeate waters at a distance from their fountains ; but since it is no small advantage to the greater part of our invalids, in chronical cases, to travel and join the benefits of air and exercise to those of the waters at their fountains, they will in that case drink our own waters in a so much greater degree of perfection as will undoubtedly give them a just title to the preference to the *German Spa* in the state in which it arrives to us, in most

or all the diseases in which the last is properly prescribed; to which add that the very expence of drinking the *Spa* water here in such quantities as are necessary to effect notable cures, would be very grievous to many; and moreover our own Chalybeates, as being less loaded with the Mineral and having less acrimony, are found upon experiment to agree better with some delicate stomachs:

Secondly, as to *Sulphureous waters*, I have shewn that the northern parts of this kingdom abound with them, and have given a more distinct account of both their contents and singular virtues than has yet been published of such waters; and if it was worth *John Baubine's* while to write a large treatise on the particular waters of *Boll* in *Germany* (a sulphureous water weaker than most of ours, which I have shewn, particularly that of *Swadlingbar*, to be possessed of like and equal (if not superior) virtues as those celebrated *Aque Bollenfes*) I hope my reader will not accuse me of officiousness in devoting one division of a small treatise to a description of seventeen several waters of that sort.

Thirdly, nor are we destitute of *Purging waters*, particularly the city of *Dublin*, where they are most wanted, is plentifully supplied with a considerable number of springs of this sort, (and it is probable a further search may discover more than those I have described in other parts of the kingdom) which have the same excellency of other Saline and Nitrous waters, *viz.* of operating briskly and without gripes or dejection of spirits, so that we are under no necessity of being supplied with such waters from abroad as formerly, ours being of the same quality, but stronger than those of *Detwicks* and *Strettham* near *London*.

Fourthly,

The P R E F A C E.

v

Fourthly, we have a very considerable number of *Vitriolic* waters properly to be denominated *Acidule*, of which I have given a more minute examination than has yet been published of such waters, having distinctly demonstrated the Vitriol (tho' some celebrated Authors have denied the existence of Vitriol in waters) and shewn the virtues of some of these waters from experience.

Fifthly, we have some few *tepid springs*, one in particular of late years introduced into practice by its merit, *viz.* the *Mallow water*, which might be a good *Succedaneum* to that of *Bristol*, of which considerable quantities are yearly imported, to which our *Mallow* water agrees both in principles and in virtues.

Sixthly, it appears from the following History that we have several *Petrifying springs*, even in the small district of the County of *Dublin*, and it is highly probable that many more will appear on a further search.

Lastly, I have shewn that the *Natron*, or native alkaline Salt is found in many of our springs, a Salt of which the greatest part of the *Engl^{ish}* writers have been silent.

But notwithstanding this faithful representation of the state of the Mineral waters of this Country, I am well aware of the great strength and prevalence of the prejudices of the people against these native productions of their own soil, and that there is too little prospect of success in an attempt to introduce our own Waters in opposition to the Fashion, established with the growing luxury of the times, of preferring all foreign productions to our own, which however as it is in a great measure the design of the present Work, I shall endeavour to shew its importance and usefulness by the following considerations.

The P R E F A C E.

1. It were doing injustice to the subject not to affirm that by the sole use of our own Mineral waters many signal cures are yearly wrought in the face of the sun, out of the reach of all other medicines, even judiciously prescribed, and many in deplorable cases eluding all other efforts of physick and surgery are by the use of these waters alone recovered, as abundantly appears in numerous instances in the following Essay, wherein also are discovered divers Virtues in the Sulphureous Waters which I apprehend to be altogether new; and in the Vitriolic I have given some incontestable evidences, altho' from empirical and casual practice, of their powerful efficacy in some of the most rebellious diseases.

2. At the same time there is too much reason for applying the observation of *Henricus ab Heers* concerning the foul play the waters of *Spa* frequently meet with, to the Mineral waters in general, viz. that physicians sometimes dismiss their patients to them in deplorable cases, in order that the death of such, or the invincible stubbornness of their distempers may be removed out of sight: for indeed nothing is more common than to make them the last refuge in desperate cases, so that the Mineral waters are far from having an equal chance given them with other Medicines, which if they had, and were more timely ordered by physicians as well acquainted with this as any other branch of the *Materia medica*, there is no doubt but their success would prove far more happy than it frequently does; to encourage which, and to render the Mineral waters the subjects of a rational practice by deducing their operations and virtues from solid principles, is the design of this undertaking: And physicians need not be afraid of a prostitution of the secrets

crets of their art by this publication of the virtues of the Mineral waters in *English*; for the judicious application of not only the different kinds of these waters, but of those of the same kind, according to the different strengths of their impregnation, to the various habits, state of the humors, age and sex of the patients, their different diseases and the different stages of the same disease, and many other circumstances, besides the preparation of the body, and what auxiliary medicines to interpose or subjoin to a course of the Waters, will ever remain a mystery to all but those who have made these things their particular study, for want of an acquaintance with which divers mischiefs and sometimes sudden deaths have ensued and will ensue, on the indiscriminate use of these and all other remedies, as has appeared on the indiscriminate, rash, and unadvised use of Tar-water, Sea-water, this, that and the other Spaw or Lough water, crude Mercury, &c. now cried up as Catholicons, by and by sinking into utter neglect and disuse, whilst the sagacious observer well aware that all these have their virtues and vices according to their right or wrong application, pities the giddy multitude and grows wise by their caprice and folly.

3. It is no small recommendation of Mineral waters, that they are for the most part not less pleasant than efficacious, or at least free from both the nauseousness and expensiveness of other medicines.

4. In many chronical cases greatly distressing both to the patient and physician, which sometimes baffle his best and most anxious endeavours, it is no small consolation to both to have an *Apylum* to fly to with some probability of better success. Such have the Mineral waters often approved themselves to be, with a

The P R E F A C E.

most agreeable event in many cases not quite desperate, where all the helps of pharmacy had failed.

And this would prove more frequently the case if a more early recourse were had to the Mineral waters than is commonly practised, of which it seems not impertinent to give a few instances.

1st, In Scorbutic and Scrophulous cases, in the more rebellious of which that modish medicine Mercury has been long used with very little credit to the profession, not to say to the injury of the patients, whereas the good effects of the Mineral waters in these cases are acknowledged by the best Authors and confirmed by Experience.

2^{dly}, In some circumstances of Consumptions not altogether deplorable, wherein we have too frequent occasions of acknowledging the vanity of the common run of Pectorals, Balsamics, and even of a Milk-diet, it may be also worth while to have a more early recourse to our mild Chalybeate waters, there being several instances of persons not too far advanced in this case recovered by the use of these waters alone or mixed with milk.

3^{dly}, In obstructions of the Liver (the attendant, if not cause of most chronical diseases) tho' I be not so sanguine an advocate for the waters as to believe that inveterate *Scirrhus's* of that bowel can be removed by them, yet I am convinced from divers well vouched histories of our own waters proving equally efficacious with the *German Spa* in these cases, in which their operation is rendered more intelligible by the modern Anatomical Observations of the absorbent mouths of the mesenteric veins opening into the cavity of the stomach and guts, which therefore may be supposed to take up and convey a considerable quantity of the

waters

waters drank, to the *Vena Portarum*, and so directly to the Liver, without passing the longer round or course of the common circulation:

And as bad Agues, especially of the autumnal kind, are apt to leave obstructed *Viscera* behind them, the Chalybeate waters are found excellent in carrying off their reliques, probably partly on this account.

4^{thly}, If in many such cases as those above mentioned, our Grandees were to be dismissed to our own waters instead of those of *Bath*, *Spa*, or *Aix la Chapelle*, they would have as good and sometimes a better chance for recovery, as has been proved by tryals made of both, some of which are specified in this work.

Next, A considerable political advantage of the use of our own waters would be the promotion of an inland commerce and circulation of money among ourselves, not only in consequence of the recourse necessary to be had to the fountains where the waters do not bear carriage, but also, as in *London* they have their *Mineral-water-warehouses*, the like might be erected in *Dublin*. What I have above observed concerning the Chalybeate waters to this purpose I need not repeat, and the Sulphureous waters generally keep much better than the Chalybeate, and might be sold and drank to advantage in *Dublin* and other places remote from their fountains: the Vitriolic waters bear carriage better than either of these, and the Purging waters may be sent from *Dublin* to the remotest corners of the kingdom without the least diminution of their virtues.

The Method pursued in my examination of the several Waters in this History, has been, in order that their several Classes might be constituted according to Nature, first to lay down their sensible qualities both

at

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at their fountains and remote from them, and out of the numerous experiments that have been made in order to ascertain their Contents, to select only such as seemed the most essential, endeavouring on the one hand to avoid such a multiplicity of experiments as would tend rather to perplex than instruct, and on the other hand to escape the just censure of such a superficial enquiry as would be inconclusive.

Next to give the *Analysis* of the Waters, first by the gentle process of Nature in the secession of the impregnating matters to be subjected to proper tryals, and secondly by such a degree of artificial heat as should not destroy the natural texture of the minerals, or but very little alter them from their natural state; and from a collective view of the result of these several observations and experiments to subjoin to each Water a *Corollary* expressive of the respective predominating Mineral, and of its combination with other Minerals where this was remarkable: then the sensible Operation and Effects of the Waters on the human body, where tryal of them has been made, are described; and lastly their Virtues, not from Speculation, but plain matters of Fact, without flourish or the pomp of fallacious Reasoning.

In the experiments exhibiting the several quantities of the solid contents in each water by exhaling to dryness, it is to be noted that the quantities here given do probably all fall considerably short of the real quantities naturally existing therein, because some part of the contents are lost in these experiments by evaporation: Thus *Marfili* (a) observes, that a quart of sea water by the areometre contained eight drams, ten

(a) *Histoire physique de la Mer.*

grains of salt, whereas by distillation the same quantity yielded but six drams, thirty grains; and the *Ocra vaporans* is a proof of the loss of the ferruginous parts in Chalybeate waters upon spontaneous exhalation; and that terrestrial particles are also in part exhaled appears from the experiments on our *Mallow water*, which by a simmering heat yielded a double quantity of calcarious matter to what it did by a boiling heat.

It is very probable that it will be objected against the minute detail here given of the great numbers of Waters of each Class, as well as the repetition of the same experiments on the several waters, that this is a superfluous labour, and that it would have sufficed to have given the experimental history of some one water of each Class, and referred the rest of the same Class to it: to which I answer

1. That as the design is to give a general idea of Mineral waters, it was impossible to do this without a large number of particular waters: nor could the identity or similarity, with regard to principles, of the several waters of each Class be established but by exhibiting the congruous appearances arising on the same experiments made on them.

2. Where it appears that a considerable number of waters of the same Class agree in most or all sensible appearances, the physician may prescribe one for the other, and give the preference to that whose situation is most commodious to his patient; and as some valuable springs have been sometimes lost, this loss may be supplied by others at discretion.

3. It is of use even to describe such waters as have been formerly well known and used, and their good effects

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effects experienced, tho' they may be now lost, because by comparing their appearances with those of others of the same Class shewing an agreement in principles, these may be substituted instead of the lost Waters, with a reasonable prospect of the same good effects; and accordingly I have done this in the Chalybeate waters of *Dunnard*, *Bullymascanan* and some others.

4. But there is another reason for this minute detail of the several waters of each Class and of their histories, *viz.* that those of the same Class or denomination do frequently differ from each other considerably, either in the different proportion of the same principles, or in their various mixtures with others: thus with regard to the Chalybeate waters, besides that most important difference of their retaining or not retaining their original qualities at a distance from their fountains, some of them moreover are exquisitely the pure, containing nothing worth notice but iron and pure element; others besides Iron or its Ore, have licked up a considerable quantity of calcarious earth, nitre or marine salt; some again border upon the acid, or participate in some degree of a vitriolic salt, and so are more powerful bracers in operation, and keep longer, of which sort I have described several in the northern parts of this kingdom: some manifestly betray a little Sulphur combined with their iron, some the *Natron* or native Alkali, like the *Pouhon* spring in *Germany*, and others the *Natron*, Sulphur and Iron, like the celebrated *Gronstierre* water. Such is the variety occurring in our several Chalybeate waters, and how far this may in any case diversify their operation, and give the preference of any one to

to another must be left to those who are proper judges of these matters.

The like reasons induced me also to give a minute and distinct account of the several Vitriolic waters, which differ greatly in the proportions of the impregnating salt, as well as in the degree of acrimony of the same, which in some of them is caustic, altho' there are some of those waters that may be taken internally with safety and good effects, as hath appeared from experiments made by the vulgar without regular prescription :

So in respect to the Purging waters, the different quantities of the respective salts in each water render a greater or lesser dose necessary, and their different combinations with Iron, Sulphur or calcarious earth deserve to be specified.

Nor lastly, was it less necessary to give a like minute detail of the several sulphureous waters, viz. not only to supply a competent number of such as being similarly impregnated may be occasionally substituted one for the other at the discretion of the physician, but where there was either a greater or lesser quantity of Sulphur, or where the Salts combined with it varied in proportion or quality, in different waters, or where the Sulphur was combined with Iron, such varieties seemed necessary to be described, in order that a just preference might be given to one or another according to the nature of the case depending.

I am not unaware of an objection which may be made against some of the accounts given in this work of the virtues of some of the Mineral waters, viz. that they may be influenced by the selfish views of some of the inhabitants, or even of the physicians in
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the neighbourhood of the several waters, who may be apt to exaggerate their praises in order to bring a resort of people thither: and indeed I must own there is weight in the objection; however, I have endeavoured to lessen it as much as possible by the method I have taken in giving both the general History and the Virtues of the several waters, *viz.* by a previous investigation of the contents of the several waters of the same Class, the similarity of the Mineral impregnation is established, than which method nothing can contribute more to take off a partiality in favour of any particular water: and tho' it be not safe to draw conclusions of the general virtues of the waters of any one Class from the virtues of any particular water, yet where we have the same accounts of the virtues of such waters from different places and countries, and some of these from disinterested persons, a similarity in operation and virtues is also without rashness inferred; and in order to render the account given of the effects of waters as impartial as possible, I have in this and my larger work not only given cautions concerning their use, but industriously also sought out and mentioned their vices and mischiefs as well as their virtues.

Before I conclude, it seems necessary to animadvert on two Abuses committed on occasion of drinking the Mineral waters, the first of which tends to defeat their good effects, the other is in a particular manner discouraging to the use of our own waters.

The first is, what the drinkers themselves sometimes fall into, being by the great resort of people to the wells, some of whom attend for meer pleasure, seduced into excess of eating, drinking and exercise, which

which, with unseasonable hours, are utterly to be forbidden in a course of water-drinking. The patient should be cautious, even of indulging the voracious appetite commonly excited by the waters, much more of late suppers and midnight-revels and all violent exercises, particularly dancing to excess.

Indigestion is the parent of many of the diseases for which relief is here sought, and he that indulges himself in varieties of meats and drinks lays in fuel for fresh crudities; and violent exercise disturbs the gentle and easy process of Nature in carrying on the several secretions and discharges.

It was therefore a wise institution and continues an established rule at *Bath*, and well worthy of imitation, that no body there gives entertainments, and that they depart from their assemblies by signal at a certain early hour, which none is permitted to exceed.

The other Abuse necessary not only to be taken notice of, but absolutely amended, if we would ever effectually encourage the use of our own waters, is the sordid, extorting disposition of some of the proprietors of the Inns and Houses of entertainment situated near the wells, which sometimes renders an attendance here equally or more expensive than at the foreign waters, by which means many who might be relieved here are deterred from coming, and others are furnished with a specious pretext for going abroad; and thus these short-sighted persons destitute of all public spirit, and devoted meerly to a present profit, are commonly disappointed and abandoned according to their demerits, as on the contrary the people at *Spa* in *Germany* have secured to themselves a lasting market by

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by observing the sounder policy of supplying the invalids and strangers who resort to them with every thing necessary to their support or entertainment at a reasonable price.

P. S. On a review of the work an inaccuracy appears in the description of a certain Colour arising on some Mixtures, expressed by the words *amber* or *brown amber*, by which is generally intended a high Beer-colour.

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N A T U R A L

EXPERIMENTAL and MEDICINAL

H I S T O R Y

Of the MINERAL WATERS of IRELAND, &c.

B O O K I. S E C T. I.

Of the Comparatively pure Waters in general, and more particularly those in the Neighbourhood of DUBLIN.

IN the general History of mineral waters, I have shewn that no water is absolutely pure, but that those which make the nearest approach to simplicity do contain some mixture of Earth, marine Salt, Nitre and Sulphur.

Ireland, however is supplied with spring-waters dispersed here and there thro' all parts of it, which perhaps make as near an approach to pure element as any in the world : for divers of ours yield less solid contents than those ranked among the purest by the modern writers, who have analytically examined them, particularly *Trumphius*, who mentions the quantity of two grains in a pint, as the proportion contained in the purest waters ; and Dr. *Hales* observes, that the spring that supplies *Hampton-Court*, one of the purest in *England*, yields but one grain and half of solid contents from a pint : but divers of our waters yield a considerably less quantity than either of these, even less than the proportion of one grain from a pint, particularly some springs from the mountainous parts of the counties of *Dublin* and *Wicklow*, which yield but five or six grains from a gallon, which waters lathered instantly smooth with soap, and continued clear with alcalies,

Tom. 7.
Act. Acad.
Cæsar. in
historia
naturali
urbis Ver-
dæ.

and excited no fermentation with acids, being destitute of calcarious earth.

These are the waters of which *Hoffman* speaks, as being purer than rain water, and most to be esteemed in drink for the preservation of health, and for the cure of many chronical diseases, as hath been found by experience, such waters passing quickly thro' the minutest canals, diluting and sweetening the salt, acid, and tartareous dyscrasy of the juices in the gouty, &c. and indeed, whosoever rightly understood the various uses and virtues of pure water, whether cold or hot, externally or internally administred, would undoubtedly be possessed of a medicine which would better maintain it's claim to the title of *Panacea*, than any of the boasted productions of Chymistry. As a general drink, it is in point of wholesomeness infinitely preferable to all the pretended improvements of it by art; and as to the alacrity induced by the use of spirituous liquors, which so much bewitches men in their favour, it is certain, that a more lasting cheerfulness is produced by several of the waters treated of in this work, without the aid of the artificial inflammable spirits, and with this advantage, that this last is not attended with those qualms, sickness and other disorders, which are entailed on the use of spirituous liquors, and for which pure water is the best remedy known.

The springs of the city of *Dublin* are far from yielding pure waters, but in every part of it they are brackish and laxative, excepting that of *St. James's-Well*, *Mary's-Abbey* and a few others, the first of which yields but about twenty four grains, the second not above twenty nine of solid contents from a gallon, being a less proportion than in the *Bristol* water, and so perhaps these might be ranked also among the comparatively pure waters, whereas the hard waters yield from forty to one hundred and twenty grains and upwards of salino-terrestrial matter from a gallon.

The famous well of *St. Patrick* was laxative, and so

Sect I. Of the Comparatively pure Waters.

are the springs now remaining in it's neighbourhood, and yielded me from one hundred and ten, to two hundred grains of sediment from each gallon, which was chiefly marine Salt and Nitre, as I have elsewhere shewn; and from hence their laxative quality is to be derived, whereas the binding of *St. James's* is from the comparative purity of the water, and perhaps with all the small quantity of calcarious earth it contains.

But the inhabitants of the city are chiefly supplied by waters conveyed in wooden pipes to their houses, for washing and drawing tea, partly from small rapid rivulets rising in the neighbouring mountains, and partly from the river *Liffy*, which also rises from the mountains to the south of the city, but pursues a long winding course of about forty-five miles thro' the counties of *Wicklow* and *Kildare*, and is enlarged by several brooks before it's arrival in *Dublin*, in the neighbourhood of which, where it is free from the mixture of sea-water from the tides, it is taken up by sailors, and found to keep very well in long voyages.

And indeed these waters may well deserve to be ranked among the comparatively pure; for tho' in this respect they fall short of several of the springs rising in the mountainous places, yet, if compared to the many brackish springs with which the city abounds, the quantity of salino-terrestrial matter they yield, is scarce worth mentioning, being only from twelve to sixteen grains from a gallon, and the *Liffy* water yielded the least quantity, (even a remarkably less quantity than the rivulets of the *Doder* and *Cammock*, which tho' they also rise from the mountains to the south, yet run a much shorter course) being probably more depurated in it's long course, as is elsewhere observed in the waters of rivers, especially such whose streams being rapid, run with a swift current upon a gravelly or sandy bottom, and are often broke by the many crooked meanders, and by this means are filtred.

The common pipe-water of *Dublin* however is not

wholly free from terrestrial matter ; for tho' it does not, upon a single evaporation to dryness, form a crust on the sides of the vessel, as the hard waters do, yet the tea-kettles that have been long used in boiling it exhibit a brown crusty matter, the calcarious quality of which appeared from the following experiments :

It made a small ebullition with Vinegar, a strong one with Spirit of Vitriol and *Aqua fortis*, and one dram of it was entirely dissolved in the latter, excepting three grains of a dark brown matter left undissolved, which being washed and dried, sparkled greatly on the red hot iron, being the sulphureous part separated from the terrestrial.

The same brown crusty matter being rubbed and laid by with Syrup of Violets, turned greenish, as do the absorbent earths, and accordingly also it acquired the taste of lime by calcination, and turned of an orange colour with the solution of Mercury sublimate corrosive in water.

The springs in and about *London* do also, upon evaporation of the water in common tea-boilers, afford a like matter, which *Woodward* calls fibrous, taley, sparry plates ; and he observes that *Hare-court* water will cast a crust of half an inch in thickness on the sides of the boiler in a month, whereas the *Thames* and *New-River* water will hardly yield any crust at all. The water of a spring near the Church at *Finglas* gave a cretaceous crust $\frac{1}{8}$ th of an inch thick in seven weeks ; and so did another near *Chappel-izod* in the same space of time ; but our pipe-water of *Dublin* gave a crust not above $\frac{1}{16}$ th of an inch thick in three months ; from which small quantity of sparry matter in this water, I presume the most timorous valetudinarian need be under no apprehensions of danger from drinking it ; and moreover the pipe-water of *Dublin*, compared to one of the brackish springs in the same city, by the Hydrometer of copper and brass newly fabricated by *John Clark* of *London*, manifests its superior lightness by a difference of ten degrees, or nearly $\frac{1}{16}$ of an inch.

S E C T. II.

Of the Waters of divers Loughs and Bogs, and particularly those of Lough Neagh and Lough Lheighs, the latter situated near Baillyborough in the County of Cavan. (a)

AS these two Loughs have acquired no small reputation, in the cure of scrophulous sores and cutaneous disorders, and at the same time make the nearest approach to pure water, I have accordingly subjoyned them to that, and having investigated what solid matter they contain, shall leave to the determination of others how far their operation and virtues are owing to the meer element, or to the peculiar Minerals with which they are impregnated.

I shall compare these with some of our bog-waters, and distinguish the water of *Lough Neagh* by the letter A. that of *Lough Lheighs* by the letter B. two bog waters from the County of *Dub'in* by the letters C. and E. and a water from the bog of *Allen* by the letter D.

The comparative purity of these waters appeared from hence: most of them indeed were of a brown colour, but had little taste or smell; they all made a smooth lather with soap, and most of them continued clear with Oil of Tartar and Spirit of Sal Ammoniac, and the water of *Lough Neagh* in particular is excellent for bleaching linen; and indeed the waters of most Turf-bogs and Loughs in general are soft and sweet, fit for culinary uses, and commonly nourish fish:

B 3

and

(a) *Lough Lheighs* is a Basin situated in the midst of a level piece of boggy ground, about an acre in circumference, between four barren hills in the mountain commonly called *Sieau Muldorun's*, or the *Giant Muldorun's Mountain*, which is seven miles N. of *Kells*, and two miles S. E. from *Baillyborough* in the province of *Ulster*, Diocese of *Meath*, and county of *Cavan*.

and accordingly, I found the specific gravity of the waters, A. and C. to be nearly as that of distilled water; from all which the purity of these waters appears.

The appearances with solution of Silver, and solution of Sugar of Lead with these waters, gave suspicion of some slight sulphureous admixture, *viz.*

The solution of Silver turned the water A. bluish, and exhibited a white yellowish sediment, and the solution of Sugar of Lead had much a like effect on the same water. Again,

The solution of Silver with the water C gave a subtile milkiness and white sediment, and the solution of Sugar of Lead gave a subtile whitishness and a small yellowish cloud with the same water C.

The solution of Silver and the solution of Sugar of Lead both gave yellowish grumes with the water D.

But the solution of Silver gave to the water E. a subtile whiteness only, and the solution of Sugar of Lead some small white grumes to the same water E.

Next, the water A. made no ebullition with Oil of Vitriol, Spirit of Salt, or Vinegar, but the waters C. D. and E. made a minute ebullition with Oil of Vitriol. See a concurring experiment below on the respective sediments of these waters mix'd with acids.

The ANALYSIS of those several Waters.

A GALLON of the water A. taken from different parts of the Lough, and at different times, yielded by evaporation different quantities of contents, (tho' of the same quality) *viz.* in three different specimens three, seven, and thirteen grains.

The water B. yielded a much larger proportion of contents, *viz.* forty grains from a gallon :

The water C. four grains, the water E. eleven, and the

Sect. II. *Of the Comparatively pure Waters.*

the water D. fourteen grains from the same quantity.

The contents, or *residuum* left upon evaporation of the water A. were a dark brown matter, somewhat viscid, of a brackish, bitterish and empyreumatic taste, and of an odd, rank flavour.

It sparkled greatly on the red hot iron, as powder of turf did, and stunk and burn'd black; it excited no ebullition with Oil of Vitriol, Spirit of Salt, or Vinegar, herein, as well as in the darker colour, differing from the sediments yielded by evaporation from common springs, which generally ferment with all acids, and are white or gray, being of a calcarious nature, whereas this seems to be a matter like turf, or dried mud.

The contents, or *residuum* left upon evaporation of the water B. were black, with some shining particles interspersed, of the same empyreumatic smell, and saline and bitter taste as the former, and it likewise sparkled on the red hot iron.

It gave an amber tincture to Spirit of wine rectified, to which water added precipitated the dissolved matter in yellowish flakes, which is no more than what occurs in a like tincture extracted from black turf.

From about twenty grains of this *residuum* boiled in fair water, filtered and evaporated to dryness, I obtained six grains of a brown salt of a pungent, bitter, empyreumatic taste, (b)

The following experiments made on the mud of the water B. shew that this water is no other than a tincture of that mud, viz.

This mud being dried, (tho' this is not easily done, it being greasy and remarkable for keeping long moist) is of a rank smell, and when burnt in the crucible somewhat resembling that of burnt horn: It emitted

B 4

a blue

(b) The ashes of common turf, yield a salt shooting into crystals, partly cubical and partly nitriform. See the chap. of *calcarious Nitre* in my general History of mineral waters.

a blue flame : It did not ferment with Vinegar or Oil of sulphur

The decoction of the same mud in rain-water yielded a brown tincture, which exhaled to dryness gave a *residuum* agreeing in all experiments to the *residuum* of the water it self obtained by evaporation to dryness, and particularly, in yielding the same proportion of the same sort of brown salt above described, obtained from the *residuum* of the water.

The several *residua* of the waters C. E. and D. agreed in colour, taste, and other properties to the *residua* of the waters A. and B. but with this difference, that the *residua* of the waters C. E. and D. did excite an ebullition and acid fume with Oil of Vitriol, which the *residua* of the waters A and B. did not, even as the water it self of C. E. and D. did also make a minute ebullition with Oil of Vitriol, which the water of A did not.

COROLLARIES.

1. THE waters of the above loughs and bogs are for the most part comparatively pure, or impregnated with a very small quantity of solid contents, in several of them not exceeding the proportion contained in an equal quantity of rain-water.

2. The water of *Lough Neagh* and *Lough Lbeighs*, seem to be little more than an infusion of their mud, or of a turf like matter in fair water, having this peculiar in the *residuum* which they yield by evaporation, that it is of a dark brown, black colour, of a more unctuous quality and nourishing the fire more than the *residua* yielded by common spring-water, which are whitish and of a calcarious nature.

3. *Lough Lbeighs* contains a much greater quantity of this unctuous matter than any of the bog-waters, and than the water of *Lough Neagh*.

The *residuum* of *Lough Lbeighs* is of a black colour, with some shining particles interspersed : it's mud was remarkably greasy and of a rank smell, and emitted

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ted a blue flame, indications of a stronger sulphureous impregnation, which may give it a superior healing quality. (c)

4. The bog-waters above mentioned do upon evaporation yield the like dark-coloured substance, sparkling in the fire also; but with this difference, that these excited an ebullition and acid fume with Oil of Vitriol, which the *residua* of the lough-waters did not, a probable indication of more marine salt in the bog than in the lough-waters, and consequently of a superior softness in these last, which may give them an advantage in healing Ulcers.

Thus the peculiar softness of these lough-waters, and their slight impregnation with a certain unctuous or bituminous matter, seem to give some rational conception of their efficacy in healing sores, found out by experience.

But besides this, we may perhaps also, not without some degree of evidence, call in the assistance of certain mineral steams, pervading both water and earth, which may also somewhat contribute to the healing operation of these waters.

Is it not to the activity of some such subtile agents as these, that the known property that Turf-bogs have of preserving from putrefaction not only vegetables, as in the subterraneous trees found in them, but animal substances also, *v. g.* human corpses buried in them for several years, is to be ascribed; and in No. 484. of the *Philos. Transactions*, we have an account of the skin of the hand of a woman, and an antique shoe or sandal preserved entire and sound, both tanned and of the same tawny colour, in moor-water for 600 years or nearly, according to the opinion of antiquaries concerning the time when shoes of the shape there described

Appendix
to Boar's
nat. Hist.
of Ireland.

(c) Dr. Hales, on evaporating a pound of *Lough Lbeigh's* water, found a small quantity of *Petroleum*, to which he imputes its healing quality.

described were worn in *England*. The skin was as strong as Doe-leather, and the nails entire and fresh.

And that divers mineral steams both ferrugineous, bituminous, lapideous, and particularly crystalline, do in divers places pervade both earth and water, and fix themselves on divers substances, immersed and buried in them, may appear from the following observations.

1. Whereas some turfs yield red ashes, these ashes sometimes serve the purpose of marking sheep as well as *Raddle*, an argument of an ochreous matter, or *Rubrica fabrilis* conveyed by subtile steams into, and at length incorporated with such turfs.

2. That the particles of Bitumen and Iron, do also sometimes insinuate themselves into vegetable bodies, and at length so far transmute them as to leave no vestiges of the vegetable, was evident from a curious Fossil among the collections of *Richard Barton*, B. D. taken up from a great depth under ground in the neighbourhood of *Lough Neagh*, which in the external part was plainly woody, but being broken was in the centre entirely glossy and black, like hardened pitch, was so ponderous that it sunk in water, burnt with a white flame, and from two scruples left nine grains of black ashes, which yielded very strongly to the magnet.

*Barton's
Lectures
on the Pe-
trifications
&c. of
Lough
Neagh.*

In another specimen of the same wood where there was but little transmutation, the ashes yielded but very little to the magnet.

3. The long disputed petrifying quality of the water of *Lough Neagh*, or of the adjacent soil, or of both, hath at length been absolutely determined to the satisfaction of the publick by the labours of the aforesaid *Richard Barton*, who brought from thence large masses of Petrifications and presented them to the *Physico-historical Society* in *Dublin*, wherein there was in the same mass an evident continuity of wood and stone, some parts of the same mass plainly woody, and others retaining still the shape of the wood were perfect

perfect stone; and indeed the singular nature of these Petrifications of *Lough Neagh* is worthy of observation, being entirely different from the calcareous and sparry kind occurring at *Knareborough*, and most of the petrifying springs in *England* and *Ireland*; for they are much more solid and hard, so as to spoil the edge of the steel used in cutting them; they do not ferment with acids, which the others always do, and turn into lime by the fire, whereas these when kept in the greatest fire that a wind-furnace could give for eight hours, which vitrified the crucible, were not changed; they yield fire with steel in great plenty, and a crystalline matter appears in the interstices of several of the *strata* of these Petrifications, which, where it has had room, has shot in regular figures; and moreover, some of them have iron ore mixed with the stony matter.

*Barton's
Lectures
on the Pe-
trifications
&c. of
Lough
Neagh.*

So much may suffice in support of a conjecture that certain mineral steams may have some share in the healing efficacy of some of these waters.

I proceed now to give some account of the medicinal virtues of the two Loughs above-mentioned from experience, and first of those of *Lough Neagh*; whether the healing quality of this Lough be diffused thro' all parts of it is not agreed, as it is that a certain Bay of it called the *Fisbing-bay*, which is about a mile broad, and bounded by the *School-lands* of *Dungannon*, and is commodious for bathing, is certainly possessed of it.

The Appendix to *Boate's* natural History of *Ireland*, mentions the first occasion of introducing it into practice, to have happened in *King Charles* the second's time, in a young man, who having eight or ten Scrophulous ulcers running on him, attended with a total loss of flesh and strength, had been touched by the King, and used all imaginable means for his recovery without effect; at length on eight days bathing every day in this Lough, all his sores dried up, and he was restored to health and strength; and this so remarkable a cure brought

brought many others who had running sores upon them, who were also cured in a little time: And

Of late years the use of this water has been revived in the same cases with good success in many instances, a few of which it shall suffice to mention, viz.

1. A child long troubled with scrophulous tumors and ulcers in the submaxillary glands, and, as usual, long ineffectually harassed with chirurgical applications, at length throwing these away, was cured by bathing the parts in this water.

2. Another who had been ten years scrophulous, with running sores and carious bones not yielding to surgery, was cured by daily bathing the whole body in the water, washing the parts affected with rags dipt in it, and withall drinking the water.

3. A third, who in like circumstances had been cured by bathing in this water, suffered a Relapse; whereupon it was conjectured that simple, cold bathing in any other water might prove equally effectual, which was tried accordingly, but without success, until bathing in the water of *Lough Neagh* was repeated with the same happy event as before.

Perhaps the virtues of *Lough Lbeighs*, tho' it has long since fallen into disuse, and thro' the caprice of the giddy multitude, given way to some other modish medicine prevailing in it's turn, are not less considerable than those of the preceding water.

The water of *Lough Lbeighs* however in the year 1736, was resorted to from all parts of this kingdom, and even from *England*, as an infallible remedy in cutaneous Eruptions and Ulcers; and the very mud of it was exported for these purposes; and indeed, whatever virtues are deducible from a fat, unctuous mud, the water of this Lough may lay claim to, and preferably to *Lough Neagh*, as being impregnated with more than double the quantity yielded by *Lough Neagh* water.

The fondness of Novelty in the empirical use of this

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this remedy inspired the people with far more resolution and constancy, than is commonly found in the use of medicines regularly prescribed ; for it was the practice, not only to bathe the whole body, which was done sometimes twice, sometimes thrice in a day, but particularly the parts affected frequently for two hours in a day ; and besides this, the mud was also frequently applied, and many drank the water.

This water is said to have been first used for curing horses and dogs of the Mange ; and from all the observations I could make on the numerous sick who resorted thither, I could not but be convinced of its cleansing and healing quality, in divers inveterate and rebellious Eruptions on the skin, itching, watery, livid, hard, inflamed, scurfy and scabby, and in some scald heads, and in many old and stubborn ulcers, which had baffled the common methods of cure. Among several other instances to this purpose was a Patient of mine, a Youth aged sixteen, who from his infancy had contracted from his nurse, a scurfy foulness upon his skin, and ulcers on his legs, superficial indeed, but of many years continuance, and which did not give way to a salivation. He therefore had recourse to this Lough, bathed in it twice a day, drank the water and lived on milk and vegetables three months, and was perfectly cured, continuing sound several years without relapse.

True it is that there were divers cases of this nature that did not give way to this remedy ; but this is no worse a fate than what sometimes attends the best medicines known. It is also certain, that many suffered by the empirical use of it, whilst confiding in it's efficacy alone, and neglecting proper preparative evacuations and other medicines, their ulcers were healed in one place, but fresh ones broke out in another, and many ulcers that were healed by the use of this water, broke out afresh after some months, All this however does not destroy, but rather establish the healing quality

lity of this water, which must be allowed to be considerable as an external application, which it is the physician's business to direct, regulate and improve by other medicines and a proper regimen.

Since the above observations were drawn up, Dr. *Charles Smith*, a diligent enquirer into the natural and civil History of this kingdom, shewed me a manuscript of *Philip Brady* Surgeon, which tho' never published, yet as it contains some facts which appear to me not unworthy of notice, I here communicate them to the public. 1st, The people who live near this Lough observe, that tho' it be a standing water, it never freezes.

Q. May not this be ascribed to the *Petroleum*, unctuous or bituminous matter impregnating the water?

2^{dly}, The Lough is reckoned to be fourteen feet deep in water, and four feet deep in mud, and the Author above mentioned affirms from his own observation, that at certain times, and especially before change of weather, there is a sensible ebullition, or gentle commotion all over it, at which time it throws up great quantities of fine mud, such as the people dress their sores with, and the working of the water after this manner, is supposed to impregnate it successively with the mineral it partakes of, an event agreeable to what likewise happens to divers mineral waters, which frequently on changes of the weather manifest a greater quantity of their contained Sulphur, Iron, &c. at some times than at others, as may be seen in the Histories of several of the Chalybeate and Sulphureous waters in the course of this work, and, which may perhaps serve as an illustration of the comment of an eminent physician on the healing quality of the pool of *Betbesda*, mentioned in the Gospel of *John*, which cured the blind, halt and withered, especially if they went in when the water was troubled, as we read it was wont to be, by an Angel that went down at a certain season

John v. 4. into the Pool, the immediate cause of the greater sanative virtue of which at those times, he imputes to the

the ochreous particles agitated and more copiously blended with the water.

3dly, The same Author confirms the above accounts, of the healing virtue of this water and it's mud, chiefly as a topical application, in several instances; one of a young man whose body was covered all over with sores, some a quarter, some half an inch deep, who had taken divers medicines and been salivated in vain; he was cured by a diligent application of the mud, as of *Basilicon*, to all his sores during his residence here for the season.

Another instance was a disorder of a Lady on the temple, which was pronounced cancerous and incurable by divers surgeons, and had afflicted her for some years, who was perfectly cured by the water and it's mud. The 3d notable instance he mentions, is of a man who for two years had been troubled with small *Fistula's* on the inside of his foot, which used very frequently to be inflamed and attended with a great swelling up to the knee, and excessive pain, and despairing of success, from several other remedies he had tried in vain, he at length used this water, and applied the mud by way of plaister for fourteen or fifteen days, when several splinters of rotten bones were discharged from the *Fistula's*, after which they were healed and firmly cicatrized.

Lastly, the same Author judiciously remarks, that altho' this water, and its mud, be well worthy of regard as a topical application, yet that other auxiliary medicines ought not at the same time to be neglected, but proper evacuations premised to their use, and the juices corrected, and the internal obstructions removed by the use of the Chalybeate waters, (which indeed not only he, but the best authors have ever strongly recommended in the cure of scorbutic disorders, where Mercury is either useless or hurtful,) and that providence has supplied the neighbourhood of this Lough with divers Chalybeate waters, which deserve to be prescribed,

prescribed previous to, and during the course of the Lough-water and mud; particularly, one at *Mayo*, a mile and half from the Lough, celebrated for removing obstructions of the liver and spleen, and that in a certain case of this nature he observed it to have operated by vomit and stool, without gripes or any violent commotion and with good success; and at *Corlurgen* near *Bailyborough* is another, of which I have given a particular history among the Chalybeate waters in this work; and that there is a third good Spaw situated within thirty perches easterly from the Lough, and called *Tobor Fian*, which was drank by a Gentleman who came to the Lough for his health, and among other complaints, was troubled with a burning heat, which made him unable to bear the weight of the bed-cloaths on him, and entirely deprived him of sleep; and on taking this water he was purged for forty hours without the least gripes or disorder otherwise, after which he grew cool, and his sleep returned.

Now if it should ever happen that *Lough Lbeighs*, which undoubtedly is impregnated with principles entitling it to a due esteem, as a balsamic and healing medicine, should regain it's reputation, of which I doubt not but it is still as deserving as ever it was, these hints, for a more rational administration of it, might deserve the attention of physicians.



OF THE

CHALYBEATE WATERS.

BOOK II.

As I have always endeavoured to avoid too minute and subtle distinctions in my appellations of waters, as rather perplexing than useful, I shall here wave all other subdivisions, and reduce all our Chalybeate waters to three Classes, *viz.* 1st, such as bear carriage and are of use remote from the fountain. 2^{dly}, such as if taken up early and cool, bear carriage and retain their original qualities, very little altered, 24 or 48 hours after being taken up, and consequently are of use to the people who live in the neighbouring places. 3^{dly}, such as are of use or retain their original, native purity and strength only at the fountain.

CLASS I. SECT. I.

KILLINSHAN VALLEY Water.

THE County of *Fermanagh* affords several Springs of this sort, and 1st, That on the land of *Killinshan vally* near *Magwire's-bridge*, in the mearing between *Drumgoon* and the aforesaid land: there is a bog to the S. E. of it. It sends forth a large stream.

It was sent me, as many other Chalybeate and Sulphureous waters of this County, by my ingenious and faithful Correspondent *James Leonard*, Mathematician at *Lisnaskea*, whose care and accuracy in describing, examining on the spot and transmitting to me in *Dub-*

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lin many of these waters, deserves the most grateful acknowledgment.

It was taken up *August 24, 1747*, at six in the morning, fair weather having preceded for three or days, and being examined in *Dublin* three months after, it was of a pale brown colour, of a strongly ferruginous taste, of a strong smell, not fetid any otherwise than as smith's forge-water.

It is a hard water, curdling with Soap, and feels rough under the fingers: It yielded a white and ochreous, and withal a *green* sediment, both with Spirit of *Sal Ammoniac*, and with the solution of Potashes, even as does the solution of *Copperas*, and as the water of *Coolauran*, and that between *Newtown-Stewart* and *Omagh*, of which anon.

Milk boiled with equal parts of it was thickened, tho' not curdled.

Galls turned it of a fine purple, in an instant upon the spot, and of a purple colour when examined in *Dublin* three months after; and at the upper part of the glass it was of a violet colour. Such a difference of colour from Galls between the upper and lower parts of the same glass, is what I have frequently observed in my examination of several Chalybeate waters; so that the upper parts of the glass shall be much more deeply tinged than the lower, the ferruginous parts being in an highly attenuated and subtilized state, and so by their levity affecting the upper part of the liquid.

This water had also blackened its cork.

I kept a phial of it containing only two ounces, in my bedchamber a month, where was a constant fire, notwithstanding which, and the smallness of the quantity, it immediately struck purple with Galls; and even when I rebottled the remainder of this small quantity and kept it eleven days longer, and try'd it with Galls, which I did at a board of the *Physico-historical*

Class I. *Of the Chalybeate Waters.*

historical Society in Dublin, it gave a strong tincture with Galls.

Now if this water under these disadvantageous circumstances retains its strength so long, *viz.* four months and more, undoubtedly in larger quantities well bottled and corked, it must keep much better, and like the *German Spaw*, bear carriage to *Dublin*, and other remote parts.

Hence appears a sufficient ground in Nature for constituting this distinction of the first, second and third Classes of Chalybeate waters; for indeed those waters which thus retain their chalybeate qualities at a distance from their respective fountains, are but few in comparison of the numerous Chalybeate springs which abound in almost every County.

I therefore take the liberty of proposing as a new article of Commerce, the sending some of the Waters of this Class to *Dublin* as *Succedanea* for the *German Spaw*, which I doubt not would produce equally good effects; provided, *1st*, That our people wou'd learn to exercise the same care and cleanliness in saving and bottling the waters as they do abroad, and *2^{dly}*, That our patients could be perswaded to lay aside their unrighteous prejudices against the productions of their own country.

The Analysis.

It loses its power of tinging with Galls on being exhaled for some time.

A Gallon of it yielded a large proportion of contents, *viz.* 32 grains of sediment, of a brown reddish colour, of a bitterish and subacid taste, and which fermented with Spirit of Vitriol.

It was attracted a little by the Magnet without previous calcination, but when calcined it fled abundantly to it.

On the red-hot iron it sparkled and smelt strong.

Corollary.

IT is a rich Chalybeate and seems plainly to contain some Vitriolic parts, besides calcarious Nitre and Earth; and, tho' its use is not known in Medicine, both by reason of its remote situation and late discovery, seems highly worthy the notice of the public for the reasons above given.

S E C T. II.

COOLAUHAN Water.

IT is situated on a mountain, a mile from *Lisnaskea*, and three miles from *Maguire's-bridge*, both market-towns on the road from *Inniskilling* to *Dublin*, in the county of *Fermanagh*.

The water examined on the spot by my worthy correspondent above mentioned, is of an irony taste and no disagreeable smell, tho' after a long series of warm, dry weather, it smells strong.

On its arrival in *Dublin* six weeks after being bottled, it was clear, of a ferruginous taste, somewhat putrid, and like several of the Sulphureous waters, had the flavour of boiled eggs; and another Specimen of it which had been well cork'd and rozined seven months before, made an explosion when opened, tasted like smith's forge water, did not stink much, and yet Silver immersed in it acquired a faint yellow tincture, altho' Silver kept immers'd ten minutes in the water on the spot was not tinged.

It is a soft water, for it soon lathers with soap: yet the appearance it exhibited with solution of Salt of Tartar, gives, as the preceding water, strong suspicion of a greater mixture of Vitriol than in most ordinary Chalybeates, viz. it exhibited, like *English* Vitriol,

Vitriol, a green, brown, floating grume with the said solution.

Galls on the spot tinged it of a purple colour, and deeper than many other Chalybeates in the neighbourhood, and in the specimen above mentioned which had been six weeks bottled, Galls gave a deep purple, and Logwood a deep blue, and it had tinged its cork very black.

It is used for dying wool purple.

The Analysis.

THE Scum is of a purple colour, and in the bottom of the spring is a very black gravel.

The Mud sent to *Dublin* and dried, and put on an iron made of a bright red heat, sparkled and flamed, and emitted a smell somewhat suffocating

A gallon of it exhaled left twelve grains of a dark-coloured sediment, which grew moist in the air.

This sediment diluted with water did not strike purple with Galls, so that upon this operation the Vitriol is either lost or enveloped, however the water is evidently impregnated with Iron and a little Sulphur, and is indeed a rich Chalybeate, worthy the attention not only of physicians in the neighbourhood, but in remote parts, as it seems both fitted to bear carriage, and is undoubtedly possessed of considerable virtues, as may appear from the following history.

A young man long troubled with a *Gonorrhoea*, had also been tediously harrassed with medical discipline, having for the space of two years frequently taken the usual boles and catharticks, and been twice salivated, and long confined to a regular diet, all to no effect. At length he sent for seven or eight gallons of *Swadlingbar* water, which he took, interposing sometimes the use of *Clauber's* Salt; but this also to no purpose; after the last Salivation he was grievously afflicted with a pain of his Stomach after meals.

With this and the persevering Gleet greatly wasted, he at length betook himself to the use of the *Coolan* an Spaw, which at first increased the running accompanied also with a slimy and whitish urine, which in process of time became clear, and on drinking this water several weeks he grew cooler and easier, and at length by the meer use hereof, without any other medicine, was perfectly cured both of the Gleet and of the Pain at his stomach.

Scholium. This may hint to us the powerful virtue of other like Chalybeates, as corroborators in inveterate relaxations.

S E C T. III.

DUN BON ROVER Water.

THE county of *Tyrone*, which is said to abound with Coals and Iron-ore, supplies several waters of this Class, and particularly that of *Dun bon rover*, situate in the parish of *Badanie*, in a marshy ground, at the foot of a wood.

It was of a strong ferruginous taste at the fountain, which it also retained, and without feter, nineteen days after, when it was examined in *Dublin*, when also

It lathered smooth with Soap instantly, and gave a greenish cloud with solution of Salt of Tartar, and a yellow greenish one with Spirit of *Sal Ammoniac*, even as the solution of English Vitriol does.

Having been bottled nineteen days before its arrival in *Dublin*, it had not only blackened its cork, but it turned presently of a claret colour with Galls, as it did at the fountain.

It also gave a bright blue with Logwood, at the distance of time and place above mentioned, which colour continued forty-eight hours, as that with Galls did
above

Class I. *Of the Chalybeate Waters.*

above five days; evidences of the great strength of the ferruginous impregnation.

The Analysis.

A GALLON yielded eight grains of a brown Ochre-coloured Sediment, which was of a salt and bitterish taste, fermented and turned yellow with Spirit of Salt, sparkled on the red hot iron, and was in some small parts attracted by the Magnet without previous calcination.

Corol. 1. It is a comparatively pure and rich Chalybeate, and seems to contain some Vitriolic parts more than the ordinary Chalybeates.

Cor. 2. It might (with proper care) be transported to remote places, and be drank to advantage.

It is said to purge frequently.

SECT. IV.

TULLYVEEL Water.

TULLYVEEL is part of the estate of *Robert Maguire, Esq;* in the Barony of *Tyrkennedy*, and county of *Fermanagh*, about a mile S. W. of *Claby*.

The water soon lathered with Soap.

Examined on the spot, *July 25, 1745*, by *James Leonard*, it turned instantly of a bright red with powder of Galls; and in *Dublin*, a month after, it was pretty clear, not putrid or fetid, of a strongly ferruginous taste, and Galls turned it of a deep purple, and Logwood of a deep blue, and it had blackened the cork.

Corollary.

It is a rich and comparatively pure Chalybeate, bears carriage well, and on that account is inserted

here as worthy of particular notice, as it may be drank to advantage at a distance from the fountain, tho' I do not find it has yet been medicinally used.

S E C T. V.

AGHALUN Water.

THERE is one Water more in the county of *Fermanagh*, which, as being a strong Chalybeate, and withal somewhat sulphureous, I have adventured to subjoin here, tho' I cannot vouch for its bearing carriage so well as the foregoing, but must leave the determination of this to further observation.

I received a specimen of it in *June 1748*, when the well had been lately opened, about the middle of the north ascent of a hill at *Aghalun* or *Brookborough*, near the pound, in a field held by *John Urwin Merchant*.

The water lathered smooth with Soap.

On the spot it turned instantly of a reddish purple with Galls: examined in *Dublin* several months after being filled, it soon turned of a claret colour with Galls, and on standing of a deep purple: withal it was somewhat fetid, and had a musty, ferruginous taste.

The Cork was also blackened.

Silver steep'd twenty-four hours in it became a little brown.

Corollary.

It is a rich Chalybeate, and somewhat Sulphureous, otherwise comparatively pure.

N. B. Leigh observes of several of the Chalybeate waters in *Lancashire*, that early in the morning they emit a highly sulphureous smell.

S E C T. VI.

A Water near STRABANE.

BESIDES the last water, and several other Chalybeates in the county of *Tyrone*, particularly in the mountains of *Mounterloney*, there is one situated four miles S. from *Strabane*, at the bottom of a mountain in a place called *Douglas*, near the river *Douglas*, but is never overflowed, which also deserves particular notice by reason of its bearing carriage

Having been bottled, corked and waxed, it did not arrive in *Dublin* till eighteen days after, when it still retained the ferruginous taste, and withal was rough, bitterish, clear, and not fetid.

The following experiments concur in shewing the great comparative purity of this water, *viz.*

1. The Hydrometre stood in it at the same height as in distilled water. 2. The solution of Salt of Tartar exhibited a subtile, white, scarce sensible cloud with it, and Spirit of Sal Ammoniac none at all. 3. The solution of Sugar of Lead gave a very subtile white cloud. 4. The solution of Silver turned it bluish, with a small grumous precipitation. 5. Oyl of Vitriol made no ebullition with it. 6. Syrup of Violets continued blue: all evidences of very little admixture of either calcarious Earth or Nitre.

At the same time the following experiments are proofs of the great strength of the ferruginous impregnation, being the result of an examination of this water in two different seasons, *viz.* in *September 1742*, and in *June 1744*, and when it had been taken up from the fountain eighteen days, *viz.*

The corks were as black as if dipt in ink.

Galls presently struck it purple, and the colour continued above three days after, and Logwood gave it

it a blue colour, which continued above thirty-six hours,

The Analysis.

A GALLON exhaled to a dryness yielded in one specimen eight grains, in another ten, of a dark-brown *residuum*, which was of a brackish taste, made some ebullition with Oyl of Vitriol, but none with Spirit of Salt; some parts of it fled to the Magnet, even without previous calcination, and it sparkled on the red hot iron.

Corollary.

HERE is a predominance of Iron and probably a little marine Salt.

I have not learnt as yet, that it has been, tho' undoubtedly it deserves to be, drank medicinally, only am assured of a weeping Ulcer in the leg of several years continuance, which was cured by washing in this water.

S E C T. VII.

*A Water between NEWTOWN-STEWART
and OMAGH.*

IT is situated on the road, about mid-way between *Newtown-stewart* and *Omagh*, in the county of *Tyrone* near *Cattle bill*.

Being examined at the fountain *December 17, 1742*, when the upper part of the water was frozen, the inferior part which was not frozen, was of a ferruginous taste, and withal affected the throat with a certain sharpness or foreness, which continued for a day or two.

Being brought to *Dublin* in *August 1743*, it retained the ferruginous taste, without putrefaction or fetor, a whole

whole fortnight ; and moreover, upon rebottling a part of it in a phial well corked and wax'd, I found upon opening it a month after its being taken up from the spring, it still retained the ferruginous taste (even under these disadvantageous circumstances) altho' it had precipitated some of its ochre.

Its specific Gravity is a little greater than that of distilled water, for when the Hydrometre stood in this water at $4\frac{1}{2}$, it stood in distilled water equally exposed at 5.0.

It lathered smooth with Soap after a little curdling : With Oyl of Tartar and Spirit of *Sal Ammoniac* it exhibited a brown, and withal *green* grumous sediment, even as does *Englsh* Vitriol.

The solution of Silver exhibited a white cloud, and afterwards a small blackish sediment.

The Acids of Oyl of Vitriol and Spirit of Salt, exhibited plenty of bubbles with it.

Milk boiled smooth with it.

At the fountain it turned, in the winter season above mentioned, of a reddish black with Galls, and of a blackish hue with Logwood.

When this last mentioned specimen had lost its power of striking purple with Galls, the mixture of it with Galls, on standing forty-eight hours, became wheyish, and had a bluish circle at the surface, which in three days became greenish, an argument of Nitre.

Another specimen of this water taken up in *August*, and kept in a bottle well corked thirteen days, had greatly blackened its cork, and being poured out did presently strike a deep purple with Galls, which the mixture retained deep for four days.

It also struck a deep blue with Logwood, and the blue continued deep three days.

I rebottled the remainder of the same water, in a small phial well corked and waxed, and kept it a month, when being opened it still presently struck purple with Galls ; and altho' it did not bear a scalding heat,

heat, but ceased hereon to strike purple with Galls, yet its retaining that property otherwise as above, under the disadvantageous circumstance of being rebottled in so small a quantity, evidently shews it to be one of the strongest of our Chalybeates, and that with proper care it might be transported to places remote from the fountain, and there drank to advantage.

The Analysis.

A gallon of the specimen taken up in winter yielded twenty-four grains of sediment; the same quantity of that taken up in summer gave sixteen grains only. In exhaling it threw up a white, bluish scum.

This sediment was partly of a whitish, and partly of a brown and reddish colour, and of a brackish and bitter taste. It made an ebullition not only with Oyl of Vitriol, but even with Vinegar. It sparkled on the red hot iron, and was attracted by the Magnet, even without previous calcination.

The Salt separated from the indissoluble parts bore to these but about the proportion of one fourth. It moistened in the air, was of a brackish and intensely bitter taste, and excited a great ebullition and acid fume with Oyl of Vitriol. Its Solution produced no tincture with Galls.

The indissoluble matter left in the filtre and dried, fermented with Spirit of Salt, was of a brown reddish colour, was attracted by the Magnet without previous calcination, and sparkled greatly on the red hot iron.

Corollary.

It is a rich Chalybeate, and withal by the experiments with Alkali's gives evidence of something Vitriolic more than the ordinary Chalybeates, even as I have noted several of this Class to do. It also contains

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Class I. *Of the Chalybeate Waters.*

tains a little Sulphur, absorbent Earth, marine Salt and Nitre (a).

As to its operation and virtues, tho' I can affirm little from observation, only that it has been remarked to have purged horses that have drank of it, and sometimes men, and this seems to be rather from its Vi-
triotic quality, than from the small quantity of other salts it contains, yet undoubtedly it is capable of being applied to many useful purposes in medicine, like the other Chalybeates of this Class, both at the fountain and in places remote from it.

S E C T. VIII.

DUNAGHY Water.

THERE is yet one memorable Chalybeate water more in this county, for the knowledge of which I am indebted to that publick-spirited man, Dean *Richardson*, who affirmed it to be one of the strongest Chalybeates in the King's dominions.

If, upon a more accurate examination, it should be found not to bear carriage, as I had not an opportunity of determining this matter by further experiments, I hope my reader will pardon me for inserting it here: In the mean time the following account of it may not be useless.

It lies near *Dunaghy*, four miles northward from *Dungannon*, and within two miles westward from *Stewart's town*, on the estate of *William Stewart, Esq*; in the county of *Tyrone*.

Green

(a) For further satisfaction as to the justness of the Inferences of the presence of these several Minerals in these and other Waters, I refer to the Observations on the Tables following, and to my larger Work, where the respective Characters of each Mineral, are more minutely laid down.

Green Tea at the fountain turns it black as Ink.

It has been much resorted to for many years, and used with great success in the *Chlorosis*, and in Scorbutic cases.

They ordinarily dissolve a little *Sal catharticum* Glauberi, or *Epsom* Salt in the water, as a preparative for its subsequent use as an alterative; they also ordinarily drink a glass of Whisky in the last glass to make it pass.

Dean *Richardson* assured me that a certain dissenting Minister, said to be afflicted with the Gravel, drinking largely of this water, died on the spot, whereas another person was cured of that disorder by it. I record this as a standing and useful caution against the indiscriminate use of these waters without proper advice, forasmuch as in the above unhappy instance it is probable these waters dislodged a stone which was too big to pass or repass.

SECT. IX.

A Water near BELTURBET.

THE county of *Cavan* also supplies some waters which seem to be reducible to this Class, particularly a spring situated in a large bog two miles and half E. from *Belturbet*, five miles N. W. from *Ballybays*, and about a quarter of a mile W. from a small village called the *Cross-roads* in the county of *Cavan*.

There is a high bank on the North side of the well, but it is exposed to the S. and S. W. hence the Water is doubtless strongest early in the morning.

Sixteen days after being filled and put up in a cask, at the fountain, it arrived in *Dublin*, *September* the 10th, 1743, where being examined, it exhibited the following appearances.

It was of a weak Chalybeate taste.

Class I. *Of the Chalybeate Waters.*

It lathered smooth with Soap, but not without previous curdling.

It exhibited a subtile white cloud with solution of Salt of Tartar, and a little one with Spirit of *Sal Ammoniac*, and a white sediment with the solution of Sugar of Lead.

It turned blackish, and exhibited a black sediment on standing, with solution of Silver, and the water turned Silver immersed in it, partly of a gold colour; evidences of sulphur.

It seems to contain but little calcarious Earth, for Oyl of Vitriol exhibited only some very minute bubbles, and Spirit of Salt none.

Galls at the fountain turned it of a deep claret-colour, and Logwood of a beautiful light blue.

The specimen above mentioned, after having been taken up sixteen days, gave a faint shade of purple with Galls, and a blue with Logwood, but soon fading to a purple: The water had been taken up at Two in the afternoon, *viz.* when probably in a weak state, a disadvantageous circumstance, as was also the wooden vessel it was conveyed in; notwithstanding which, as it retained a considerable degree both of the Chalybeate taste, and of the property of tinging with Galls and Logwood at the distance of time above mentioned, I have reduced it to this Class, judging that with proper care it might bear carriage.

Syrup of Violets soon turned it green.

The Analysis.

1. *Natural.* The stream tinges the earth red, and the scum of the water is like quicksilver.

2. *Artificial.* A gallon yielded half a drachm of sediment of a dark brown colour, of a brackish and bitterish taste. It grows damp in the air; it ferments even with Vinegar, sparkles a little and smells strong on the red hot iron.

The

The Salt separated from the indissoluble parts moistened in the air, excited an ebullition and fume with Oyl of Vitriol, and bore the proportion of 4 to 5 of the indissoluble matter, which last being dried, sparkled greatly on the red hot iron.

Corollary.

It is a strong Chalybeate, impregnated also with a little Sulphur, marine Salt and Nitre.

It is drank to two or three quarts and more at a time, and works chiefly by urine, but sometimes vomits and purges, especially the weakly.

It has been of service in the Heart-burn, in the Head-ach, and in the Gravel: in the Scurvy and running Sores by drinking and bathing in the water: one instance particularly is given of a woman of 80 years of age, who had a running Sore in her leg near twelve years, and had tried the water of *Lough Lbeighs* in vain, but was effectually cured by the external and internal use of this water; and another instance was given of a like happy success attending the use of it in a case like this.

S E C T. X.

A Water from BAILYBOROUGH.

IN July 1748, I received a water from *Bailyborough* in the county of *Cavan*, with which, tho' I am but superficially acquainted, it having been found accidentally, on digging for some other purpose, and bottled three or four days before I examined it in *Dublin*, yet the appearances afforded by the few experiments I had opportunity of making on it, were such, as seem sufficient to recommend it to further enquiry, viz.

It

It was both of a ferruginous taste and fetid, and tinged a Silver spoon yellow, and a Six-pence of a leaden colour, altho' with the solution of Silver it exhibited only white grumes.

It instantly struck a claret-colour with Galls, which it retained many days.

The Analysis.

A gallon yielded about nineteen grains of sediment, which presently grew moist, and was of a brackish taste like marine Salt, but it excited some pungency of smell when rubbed with *Sal Ammoniac*, and a strong urinous smell on being rubbed with Salt of Tartar.

Corol. It seems to be impregnated with the principles of the celebrated *Geronsterre* water in *Germany*, viz. Iron, Sulphur and Natron, with this advantage, that it manifestly retains these principles at a distance, which the *Geronsterre* water does not.

S E C T. XI.

A Water near BALLYCASTLE.

I was supplied with two Chalybeate waters, evidently reducible to this Class, from the county of *Antrim*, by *Hugh Boyde, Esq*;

The first from the neighbourhood of *Ballycastle*, which was sent me in *August 1742*, having been taken up at least nine days when examined in *Dublin*, in bottles well corked and waxed.

It had a very strong ferruginous taste, was very rough, and of a fetid smell.

Notwithstanding its being strongly impregnated with Iron, it was remarkably light, viz. lighter than distilled water, for the Hydrometer stood in this water at 5 $\frac{1}{4}$, when in distilled water it stood at 5.0.

D

Soap,

Soap, after a little curdling, soon lathered with it. Oyl of Tartar, and Spirit of *Sal Ammoniac* exhibited only a subtile wheyishness, the solution of Silver a small white grumous subsidence; but Silver immersed in it became first yellow, and then of a leaden colour, Gold of a deeper yellow.

Oyl of Vitriol and Spirit of Salt caused no ebullition with it, and Syrup of Violets gave only a light green, from which experiments joined to those of the preceding paragraph, it appears to have very little calcareous Earth.

It had blackened its cork, and it struck a deep purple with Galls, which next morning became a deep violet blue; and moreover, even the water in a bottle opened and left half empty two days, still struck a deep purple with Galls tending to violet, from whence I conclude it to be one of the strongest Chalybeates in *Ireland*.

Logwood gave it a blackish blue tincture.

The Analysis.

A gallon exhaled gave twenty-one grains of sediment of a brown ochry colour, and of a brackish taste. It made an ebullition with Vinegar, turned green with Syrup of Violets, and sparkled much on the red hot iron.

Corol. It is a very rich Chalybeato-sulphureous water, with very little Salt or Earth, very light; and, tho' I have not learn'd that it has been much used, yet it's undoubtedly highly worthy of notice, as applicable to many good purposes in medicine, not only at the fountain, but at great distances from it.

S E C T.

S E C T. XII.

KNOCKLADE Water.

THE other water sent me to *Dublin* from the county of *Antrim*, in *October* 1743, was taken out of a small well on the side of a great mountain called *Knocklade*, on the lands of *Dromons*, in the parish of *Ramoan*, very near to the houses on the high road in the said lands.

It had been bottled seventeen days before its arrival and examination in *Dublin*, when it had a strong chalybeate taste without fœtor, and struck a deep pink colour with Galls, and a deep blue with Logwood, and both these tinctures continued 24 hours, viz. in open glasses; but the tincture with Logwood vanished in 48 hours.

Corol. It is a strong Chalybeate and worthy of notice, as it bears transportation to remote places.

S E C T. XIII.

THE county of *Down* also supplies some waters of this Class, as particularly

The GRANSHAW Water,

Which is situated in a small valley surrounded on every side by hills of a gentle ascent, above three miles from *Donaghadee* in the county of *Down*.

It hath been deemed as good as *Tunbridge* water, but (b) from the following examination of it compared to the accounts elsewhere given of *Tunbridge* water, I reckon this much better and stronger.

(b) Ancient and present State of the county of *Down*.

It retained the ferruginous taste some weeks after it had been bottled; and moreover

A certain curious lady having with great care filled a bottle exquisitely clean with this water on the spot, and well corked and rozined it *September 25*, the bottle was opened in *Dublin, October 22*, following, when it sparkled in the glass, had the ferruginous taste strongly, and withal had no feter.

On the spot, being examined at five in the evening, (a most disadvantageous time) it struck a most deep purple with Galls, almost like ink.

The bottle above mentioned that had been filled *September 25*, and was opened *October 22*, instantly struck purple with Galls, and blue with Logwood, and both these tinctures purposely exposed in an open glass, continued deep 24 hours.

In order to examine further the strength of the martial impregnation, I rebottled the remainder of the above water, *Octob. 23*, and opened it again *Nov. 23*, and found it still strongly ferruginous, and not fetid: Then I rebottled the same water again, and kept it until *January 18*, viz. almost four months after it had been filled, and notwithstanding these disadvantages of repeated opening and rebottling, it still, on the said 18th of *January*, retained its ferruginous taste strongly, and struck purple with Galls, but smelt somewhat musty.

From the good success of the foregoing experiment, I suspected that the feter some of our Chalybeate waters acquire by transportation to remote places, may sometimes be owing to some foreign taint in bottles not thoroughly clean.

The last mentioned parcel of water kept three months in *Dublin*, gave with Spirit of *Sal Ammoniac* a sediment partly white and partly ochreous.

From the above Experiments, and the others herewith concurring on the waters of this Class, it is obvious to conclude, that if we knew how to prize the bounty

bounty of Providence, in these native productions of our own country, we shou'd have little need of the foreign Chalybeates, or at least when the importation of these fails, as that of *Pyrmont* and *Spa* sometimes does, we might be supplied at home by the waters of this Class that bear carriage.

The Analysis.

1. *Natural.* It throws up a thick scum, white and yellow.

The ochreous matter it spontaneously deposited was attracted in some small parts by the Magnet.

2. *Artificial* A gallon yielded about twenty four grains of an ochre-coloured sediment, which fermented with Oyl of Vitriol, and even with Vinegar, crackled a little, and sparkled and stunk on the red hot iron, and was of a brackish taste, shewing marine Salt mixed with the Ochre.

It has been observed to sit light on the stomach, to pass quickly by urine, and to have been serviceable in the Gravel.

A lady troubled with a suppression of the *Menfes*, and an inveterate *Diarrhea*, baffling all other remedies, was recovered by drinking this water, which stopped the *Diarrhea*, and restored the menstrual flux.

S E C T. XIV.

KILLAGHEE Water.

IT is situated three miles almost North of *Grasshaw*, and in the same parish of *Donaghadee*, in the county of *Down* (c).

On the spot the taste and the appearances with Galls
D 3 were

(c) Ancient and present State of the county of *Down*.

were much as in the *Granshaw* water, save that it did not strike quite so deep, nor so dark a purple with Galls.

Some of this water which had been taken up some weeks, exhibited some curds with Soap, but soon lathered smooth. Oyl of Tartar turned it whitish, and exhibited some minute bubbles at the bottom of the phial, and a small ochreous cloud. Spirit of Hartshorn a little Opacity, and a small ochreous separation: solution of Sugar of Lead, a white cloud, and a small white precipitation: solution of Silver a subtile wheyishness.

Oyl of Vitriol and Spirit of Salt some very minute bubbles.

Syrup of Violets turned it of a bright green.

The same curious lady above mentioned filled a bottle with this water, *September 15*, on the spot, the bottle exquisitely clean, well corked and rozined, which was opened in *Dublin* five weeks after, when it mantled in the glass, tasted strongly ferruginous and astringent, and instantly struck purple with Galls, and blue with Logwood, (and both these tinctures continued deep twenty-four hours) and withal it was not fetid.

The same water was rebottled and opened a month after, and still retained the ferruginous taste, and was not fetid: then the same water was rebottled again, and opened not until about two months after, which was four months after its being first filled, and tho' it was fetid, it had the ferruginous taste strong, and struck a deep purple with Galls.

The Analysis.

It throws up a scum like the *Granshaw* water, which is also considerable in evaporating the water.

A gallon yielded about twelve grains of a brown, ochre-coloured sediment, of a brackish and bitter taste, and which flamed and stunk on the red hot iron.

Corol.

Corol. It is a comparatively pure and strong Chalybeate, having but little mixture of calcarious Earth, Nitre or Salt, and bears carriage.

It has some visitors for the Scurvy, and is drank with the Salts.

Two waters more which seemed to promise to bear carriage also, were transmitted to the *Physico-historical Society* in *Dublin* from the same county, viz. one from *Mount Norris*, a village seven miles from *Newry*, another from the foot of *Slieve Gullian* about two miles from *Newry*: they were both soft waters, and retained their ferruginous taste, and struck of a pale purple or pink colour with Galls when six days taken up, in the month of *July*, and withal did not stink.

SECT. XV.

BALLYPOREEN Water.

I proceed now to give the histories of some of the Chalybeates of the *South*, which also promise, with due care, to bear carriage: and first of the water of *Ballyporeen* in the county of *Tipperary*, which was examined at the fountain, and in *Dublin*, seven, and twelve days after being bottled in *April*, and in *August*, 1743

On its arrival in *Dublin* it had a bluish cast, was perhaps in a putrid state; for besides the ferruginous taste, it had a smell like rotten eggs, and besides this smell and the bluish cast, gave further cause of suspecting a combination with Sulphur, viz. it tinged Silver immersed in it of a fusc, leaden hue.

It lathered with Soap after a little previous curdling: it continued clear with Oyl of Tartar and Spirit of *Sal Ammoniac* in one experiment, tho' it whitened with Oyl of Tartar in another, and withal exhibited some small bubbles.

The solution of Silver gave a white cloud and then a blackish subsidence like ink.

It made scarce any ebullition with Oyl of Vitriol, Spirit of Salt or Vinegar, so that it contained but little calcarious Earth.

Syrup of Violets turned it of a willow green.

On the spot it struck a deep, muddy purple with Galls, even in a rainy season: in *Dublin* a dilute claret-colour, and with Logwood a blue; and both these tinctures continued in an open vessel above 36 hours, and it had greatly blackened its cork, arguments of the strength of the martial impregnation: to which add, that more than twelve days had pass'd, and besides this the bottles had been several days opened, when Logwood continued to give it a blue tincture, tho' very soon fading to a purple; so that from all appearances it is a very rich Chalybeate, and in all probability, with proper care, it would bear carriage to remote places.

The Analysis.

1. *Natural.* The sediment spontaneously deposited and dried, is vigorously attracted by the Magnet, even without calcination, and sparkles greatly on the red hot iron.

2. *Artificial.* A gallon exhaled left about twenty-four grains of sediment, which grew very damp in the air like paste, was of a brackish and nauseously bitter taste, fermented with Vinegar, and fermented and emitted an acid fume with Oyl of Vitriol.

Corol. The water is strongly saturated with Iron and some Sulphur, with which are probably combined a little marine Salt, Nitre and absorbent Earth.

It is in good repute as a Chalybeate.

S E C T. XVI.

LIS-DONE-VARNA Water.

TH E following account of this memorable spring was communicated to me chiefly by my ingenious Correspondent *Sylvester O'Halloran*, Surgeon at *Limeric*, who generously undertook a journey to examine its contents.

It is situated in the S. W. part of the Barony of *Burrin* in the county of *Clare*, on the side of a considerable mountain about two miles from the main western ocean.

This Barony is very remarkably rocky and dry, the air wholesome, and the herbage between the rocks which lye very close to one another, very sweet and nourishing, so that the farmers send their cattle in winter hither, and it fattens them better than hay would do.

The mountain out of which the water springs, is plentifully stored with the *Lapis Hibernicus*, which is very brittle, and fatter than what is usually met with, (some species of which I have elsewhere observed to be probably the matter impregnating divers of our Chalybeate waters) of a rough, acid taste, and of a sulphureous smell when broken. A small quantity of it put into a *Florence* flask in a sand heat, seemed to exhibit sublimated into the neck of the flask, a real Sulphur or Sulphur mixed with a calcarious matter; thro' the substance of the slate, and separate from it, are found white shining Silver-coloured spangles, which burn to a black powder, probably a *Marcasite* of Iron.

The water is of a strong, astringent, ferruginous taste and smell, and not fetid.

It exhibited no whiteness with Oyl of Tartar.

Spirit of Vitriol excited no fermentation with it, tho'

tho' the water was whitish, and grew clearer with Acids.

Milk being mixed with an equal quantity of this water, and the same quantity of Milk mixed with an equal quantity of common water, and laid by in two vessels 24 hours, that which had been mixed with this water was less acid than that with common water.

Silver immersed in this water in the channels, as also in a glass for half an hour, acquired a blackish hue; the blade of a Penknife immersed in the water for some time was changed to a copperish colour, not owing to the scum of the water, the experiment having been repeated with care.

Hence it appears probable that this water is not without a pittance of Sulphur and Copper.

Syrup of Violets turned it of a faint green.

A grain of powdered Galls turned half a pint of it instantly reddish, then light purple, and at last to a blackish purple. Two grains instantly turned half a pint to an inky blackness. And

It seems to retain this quality at a distance from the source; for a bottle of it that had been kept a week well corked and waxed, exhibited the same appearances as at the fountain.

The Analysis.

It is covered with a very thick scum of a variegated colour.

Charles Lucas Apothecary, who examined it in July 1740, affirmed it yielded him the largest quantity of sediment he had observed in any Chalybeate water, viz. 136 grains from a gallon; but my above mentioned Correspondent, who visited this spring in June 1751, having carefully exhaled a quart of this water in a glazed pan, obtained but about 10 grains, or from 7 grains to 12 of a darkish brown powder, (or from 28 to 48 grains from a gallon) which powder rubbed with

with Syrup of Violets became very green, and with *Sal Ammoniac* emitted a pungent vapour, like what Potashes do when rubbed with *Sal Ammoniac*.

Corol. Here is plenty of Iron with some Sulphur and Natron, and probably a little Copper, with little or no calcarious Nitre or Earth.

It for the most part vomits, and frequently purges at the first use of it; afterwards passes by urine.

It is drank to five pints for a dose in Intermitting fevers imperfectly cured, and is said to have been successfully used externally and internally in some scabby and stubborn eruptions of the Skin, which had not given way to the waters of *Aix la Chapelle*.

S E C T. XVII.

CLOGH Water.

THE well is called in *Irish*, *Tobbernearing*, i. e. the *Iron well*, and is situated near the village of *Clogh*, in the parish of *Lisbinsair* and barony of *Gorey*, about two miles S. W. from *Gorey* in the county of *Wexford*, in a pleasant country and well supplied with provisions: it is covered with an arch of brick, and emits a considerable stream which tinges the channel strongly with its Ochre.

On the spot it was of a strongly ferruginous taste, even when examined after great rains; and having been bottled in *July* 1749, and examined in *Dublin* three days after, it still retained the ferruginous taste strongly, and withal was not fetid.

Soap lathered smooth with it and without curds.

Galls struck a deep purple with it on the spot; and a dilute claret-colour a good deal deeper than divers of the weaker Chalybeates do at the fountains, after it had been three days bottled; and the mixture of
the

the Galls and water that had been three days bottled, retained an amber tincture for eight days without change: It had also blackened the corks; as did also a Specimen of it taken up in wet weather late in the autumn; from all which it appears to be a very rich Chalybeate, and to bear carriage to considerable distances.

The Analysis.

THE ochre-coloured sediment spontaneously deposited, is attracted by the Magnet, without previous calcination, and sparkles on the red hot iron.

A gallon exhaled left eight grains, of a brown, yellowish sediment, which was of a pungent or saline taste, and yielded to the Magnet a little without calcination: it sparkled on the red hot iron: it fermented greatly with Spirit of Vitriol; it emitted an acid Vapour and caused a slight ebullition with Oyl of Vitriol; and on standing twenty-four hours mixed with Syrup of Violets became green; it smelt strong when rubbed with Salt of Tartar, and plainly urinous when rubbed with *Sal Ammoniac*. This became more evident in the Salt separated from the terrestrial matter, which also moistened greatly in the air, and from a yellow colour turned presently green with Syrup of Violets.

Corol. It is a strong Chalybeate and comparatively pure, yet not without a mixture of Natron, as in the famous *Pouhon* water of *Germany*.

It is reputed a great restorative in Consumptions, to have been of service in Asthmas, in Scorbutic disorders, pains of the Head, Stomach and Bowels, and those in the side called the Spleen, in lowness of Spirits and in the Gravel.

The following instance of its good effects seems not unworthy of notice.

John Gowan, aged twenty-two, was weak and emaciated to the last degree, with a severe Cough,
and

and withal an Hemiplegia: in this state he went to these waters, even in the autumnal season, viz. in *October 1731*, and bleeding, and some other evacuations, having been premised in regard to his paralytic disorder, he drank them for six weeks, and recovered the use of his Limbs so far as to have had only now and then some slight returns of that disorder unto this present year 1751, and his flesh and strength so far as to contract matrimony the *March* following; and, which was remarkable, he married a widow who was drinking the waters at the same time, and had born no children to her former husband, tho' a promising person, but soon proved fruitful with her new husband and consort in drinking the waters, which, among other things, gave rise to a certain Song, of which the following lines were a part.

“ Consumptive lad,
With Asthma bad,
Grew rampant and piqueering;
And widow pale
From head to tail,
Was cur'd at *Tobberneering*.

S E C T. XVIII.

DRUMKIT Water.

IT is of considerable antiquity, having been known, as I am informed, in the year 1701, and drank medicinally.

It springs at the bottom of a rock, about half a mile from *Ballynabarney*, and two miles from *Balenderry* in the county of *Wicklow*.

In two Specimens transmitted to *Dublin*, the one *September 1, 1741*, the other *October 13, 1745*; the first examined forty-two hours after its being bottled, the

the second six days after its being bottled, the chalybeate taste was still retained in both, and there was no fetor in that which had been bottled six days.

Hence it appears to be a strong Chalybeate: it is also a comparatively pure one, for it lathered presently with Soap, and exhibited only a very small white cloud with the solution of Salt of Tartar, and with the solution of Sugar of Lead.

That which had been bottled forty-two hours, struck a deep purple with powder of Galls, altho' it had precipitated a considerable quantity of Ochre. That which had been filled six days in a bottle well corked and rozined, struck a violet colour with Galls, which turned to a purple, which purple continued above seven days, in an open glass.

This water kept in a bottle well corked fifteen months stunk greatly, tasted ferruginous, struck a deep purple with Galls, and a deep blue with Logwood, but did not discolour Silver: when exposed in a glass all night, it lost the faculty of tinging with Galls.

The Analysis.

A GALLON yielded but six grains of a snuff-coloured sediment, which however appears to be comparatively pure, or at least to contain very little calcarious matter; for it made very little fermentation with Oyl of Vitriol.

It seems worth remarking, that before the introduction of the *German Spa* waters, which have now in a manner supplanted our domestic ones, the *Dunnard* water used to be brought to *Dublin* and drank here medicinally, than which however, the *Drumkit* water bears carriage far better, and keeps much longer, for which reason I have given it a place among the waters of the first Class, as the *Dunnard* among those of the second.

SECT.

SECT. XIX.

KILLESCHIN Water.

IT rises from the neighbourhood of a coal-mine situated about two miles from it, and the soil is partly a yellow clay, and partly slatey, and Iron-mine is found in the neighbourhood, about three miles from *Carlow*, and seven from *Kilkenny*.

It yields a pretty good supply of water, the well (A. D. 1755) about three feet over and a foot deep.

I examined it on the spot in *August* 1734 in a rainy season, and in *April* 1741 in a very dry season.

It had a singular flavour and strong smell, with a roughness and bitterishness in the throat; and on the sides of the glass used in taking it up, stuck something unctuous or greasy, an appearance common to this and several other Chalybeate waters.

I examined it again near the spot, viz. at *Carlow*, *Decemb.* 27, 1755, after plentiful rains, and found it strongly ferruginous, tho' considerably weaker than in drier seasons, having been taken up at ten in the morning, and examined at one in the afternoon.

Brought to *Dublin* in a bottle well corked and ro-zined, which was opened four days after being filled, it retained the chalybeate taste, tho' weaker, and the water was turbid and had deposited some of its Ochre.

It contains but little foreign matter besides the ferruginous; for it soon lathered smooth with Soap, and Oyl of Tartar, and Spirit of *Sal Ammoniac* caused scarce any precipitation with it at one time, tho' at another the Spirit of *Sal Ammoniac* and Spirit of *Hartshorn* turned yellowish with it: the solution of Silver in two different tryals gave no white sediment, nor did the solution of Sugar of Lead in one tryal exhibit any white sediment, tho' it did in another. To these evidences of little or no calcarious Earth, agreed the result of the mixture of Acids, viz. Oyl of *Vitriol* and Spirit of Salt with this water, which excited the

scarce any ebullition : and in a subsequent tryal Spirit of Vitriol exhibited but very few bubbles on the sides of the glass.

The tincture of Galls turned it of a crimson colour, which on fourteen hours standing became of a claret-colour.

The tincture of Logwood turned it of a blue, and on fourteen hours standing, of a deep blue next to a black.

In the long Drought in *April 1741*, it struck a deep purple, almost black, with Galls, and on being exposed fifteen hours in a glass, it became of a dilute claret-colour.

Brought to *Dublin* in a bottle well corked and ro-zined, and opened four days after its being filled, it struck a deep claret-colour with Galls, (and retained this tincture even on a fortnight's standing in an open glass) and a deep blue with Logwood ; to all which evidences of the great strength of this water as a Chalybeate, add, that what remained in the bottom of a bottle opened six days after its being filled, struck an amber-colour with Galls, also the above mentioned specimen taken up in *December*, and examined in *Carlrow*, had blackened the corks and struck a claret-colour with Galls, which colour continued deep twenty-four hours after.

The Analysis.

It tinges the stones and channel very yellow, as from rusty iron.

On being exhaled it stunk a little, and yielded by a mild heat from a gallon, about twenty-four grains (in another experiment A. D. 1755, in winter, thirty-six grains) of sediment, which was a dark brown, glutinous matter, of a strong, empyreumatic smell, of a pungent, bitterish taste : it moistened in the air, sparkled on the red hot iron, and in one experiment flamed ; and having been calcined an hour turned reddish, and followed

followed the Magnet a little, even at a distance, and made no ebullition with Acids: in a second experiment there was but just a sensible, small ebullition, and a fume, which tho' not visible, had the smell of *Aqua fortis*.

This *residuum* being diluted and rubbed on beef laid by two days and then boiled, the beef was red within.

Corol. It is a very strong Chalybeate, and comparatively pure, except that here is probably a little Sulphur, or rather *Bitumen* combined with the Iron; for Silver kept immersed in the water forty-eight hours (but in winter) was not tinged.

It has also a pittance of marine Salt and Nitre, but less absorbent Earth than most of these waters.

From its greater quantity of ferruginous and bituminous contents, it seems to be, that this water does not extract a pleasant-flavoured infusion from Tea, quite otherwise than *Ballyspellan* and *Dunnard* waters, which rather improve the natural taste of Tea.

It was formerly in such repute that one Dr. *Power* published a Treatise on it, nearly as large as this my whole account of the Chalybeate waters of *Ireland*, wherein however are but few solid observations or Experiments on the real nature and effects of the water, but of conjectures and trifling reasonings *a priori* enough: and such indeed were most of the writings on this subject until of late. It is probable that I have spent more years in compiling this brief Account of our *Irish* Chalybeates, than several of these Authors did days in their more voluminous performances: so much more easy is it to sit down and scribble in the closet, than to travel, correspond, spend money liberally, have a mind open to receive instruction and information from Nature herself, and from conversation not with the *Literati* only, but with the Vulgar, to labour in experiments not one, two or three, but numerous repetitions of the

same experiments in varieties of weather, seasons, time of the day, &c. besides the comparison of the several waters of the same and of a different kind, the investigation of their Contents, by evaporation, filtration, solution, crystallization, various tortures by the fire, and (which is of more importance than all) painful and laborious Observations on their various effects on human bodies. I doubt not but it may be possessed of as many medicinal virtues now as then, altho' less in vogue, like many others, from meer chance or caprice. However, A. D. 1754, there was a considerable resort to it in summer, and Dr. *Johnston*, during a short residence in the neighbourhood, hath been not inattentive to the nature and operation of this notable Chalybeate: He found no difference in the specific gravity of this water and common fountain water, notwithstanding what the aforesaid Dr. *Power* has asserted, that it is half an ounce in a pint heavier than any of the springs about *Carlou*.

In order to obtain the solid contents of this water in their native state, and not affected by the operation of fire, he exposed the water for some days in open bottles that the contents might subside, and on pouring off the water and drying those contents thus obtained by a very gentle heat, he found them to be entirely like what was obtained by evaporating the water in a Sand heat in my experiments above related.

He kept some of the *Killesbin* water in his house in bottles, well corked two months, and found that it then struck a deep claret-colour with Galls, and as deep as when newly taken from the fountain, and comparing it with some *German Spaw* water he had kept in the house for the same space of time, found that the *Killesbin* water struck the tincture sooner, and retained it deeper than the *German Spaw* water tried with the same quantity of Galls.

That tho' this water for the most part works by Urine, yet that in a lax and flabby state of the bowels it

it sometimes purges; that it has proved of great use, in several instances, in nephritic Pains and the Gravel, in loss of Appetite and Digestion, and in divers cases of the Worms in Children, is observed by the same Physician, whose situation and abilities, if ever this Work should pass a second Edition, may very probably give him opportunity of furnishing a much larger account of its good effects: in the mean time the Public is indebted to him for the following hints not unworthy the attention of Physicians:

“ A person in this neighbourhood, aged 36, has had from her infancy complaints in the region of the Liver, sometimes attended with acute pain, for which Evacuations were prescribed, and she had taken many aperient, deobstruent medicines. About a year ago she was violently affected in *Dublin*: an Apothecary bled her, and a Physician called in apprehended an indurated Liver, with some degree of inflammation: the *Menses* were totally obstructed: she observed a cooling regimen, and afterwards repeated the use of deobstruent medicines, and last summer came to this country, and, altho’ she pursued the regimen ordered, found little or no abatement of her complaints; she had very acute pains every night, which deprived her of rest; she lost her appetite, and was emaciated.”

“ After a dose of *Glauber’s Salt*, the *Killesbin* water was recommended, by using which daily and regularly for two months on the spot, the pain lessened, her appetite was restored, the *Menses* appeared, and she has continued better.”

Carlow, Jan. 2d, 1757.

In a female Pulmonary case, where there was an Ulcer in the lungs and hectic appearances, with a diminution of the *Menses*, the Doctor tried it mixed with Milk, with some good effects, as it promoted a more considerable discharge of the *Menses*, and procured a greater freedom of respiration.

Scholium 1. Thus have I, as opportunities offered, procured specimens of such Chalybeate waters in this kingdom, as retain their native qualities at a distance from their fountains, some several days, some several weeks, and some several months, and faithfully reported and digested the experiments I made on them, with what appeared to me to be the result: A work, tho' of no small labour and expence, yet not compleat, because many of the above experiments ought to be repeated, and several others are wanting to a compleat History, and to a more certain and positive determination how far the several waters above recited, will, upon tryal, bear carriage, without injury to their virtues, to remote places; and which, upon repeated trials, and comparison, deserve the preference, and how far any of them are equal to, or fall short of, the *German Chalybeates*.

The facts however above recited, are sufficient to shew, that it is not peculiar to the *German Chalybeates* to bear carriage to remote parts, but common also to several of those of our own country.

Indeed one peculiar misfortune attending us, is the scarceness and dearness of Glass-bottles: notwithstanding which, it were no rashness to affirm, that *Dublin, Cork, &c.* might be supplied with several of the native Chalybeates of this country, as good as the *Pouhon* water, by a modest computation, at one half of the expence, and still at far less from places less remote.

I therefore beg leave to propose to those worthy Patriots, who are daily encouraging a spirit of Industry by Præmiums, whether the great consumption of the *German Spa* water at a shilling a flask, considered, in the now prevailing fashion of its great use in most chronical diseases, it might not be worth while to offer a Præmium for the discovery and carriage of any such Chalybeate waters in *Ireland* to *Dublin, Cork, &c.* as
upon

Class I. *Of the Chalybeate Waters.*

upon trial should be found to retain their native qualities in perfection at such distant places.

Scholium 2. Upon a review of the foregoing accounts of the Chalybeates of the first Class, it appears that very little has been said of their Virtues: but this has proceeded meerly from want of Facts and Observations, from the remoteness of the situation of the Waters, and want of opportunity of using them, not from want of Merit in the Waters themselves;

For indeed most of these Waters are stronger of the mineral than those of the second and third Class, and consequently must be preferable where a stronger Chalybeate is required: they come nearer to the *German Spaw* water in superior strength, as well as in bearing carriage better than the Waters of the second and third Classes: they participate more sensibly of something Vitriolic than those of the second and third Classes; are more irritating, as well as more powerfully astringent, and consequently are preferable where the Solids are greatly relaxed, or where there is no fear of Irritation, as in some delicate habits, which do not bear either the harsher Chalybeates or the *German Spaw*, to which those of the second and third Classes seem to be most suitable; nor is this meer Speculation, but confirmed in Practice, having been observed long ago by *Allen*, and lately in some of the *Edinburgh* medical Essays.



OF THE

CHALYBEATE WATERS.

CLASS II.

I proceed next to the second Class of our native Chalybeates, that is to say, those which retain their original taste and power of striking purple with Galls, one or two days only for the most part, be they never so carefully bottled and corked, but within that time precipitate their Ochre and become fetid. Nevertheless, many of these on being kept, recover their taste and property of tinging with Galls, but for the most part not without putrefaction.

These waters therefore, to be taken in their original perfection and purity, should be drank at the fountain: however if carefully bottled and corked, and carried cool, early in the morning, they may be transported to the distance of ten miles and more, and drank with little loss, so that they are chiefly of use at the fountain, and to the people in their respective neighbourhoods.

S E C T. I.

A Water near ATHLONE.

IT is situate on the western bank of the river *Shannon*, into which it discharges itself by a considerable stream, being about six or seven yards distant from it, about a quarter of a mile from *Athlone*, on *Connaught* side, and so in the county of *Roscommon*.

From the neighbourhood was sent me some *brown Ochre*, which became very red upon calcination, and strongly attracted by the Magnet.

The water on the spot is of a ferruginous taste,
which

which was also sensible, and without fector, in some bottles of it sent to *Dublin*, and examined six days after being filled, and this water was full of an elastic vapor forming small bubbles on the sides of the glass: this probably proceeded from a re-absorption of the precipitated Ochre, as is elsewhere observed in the *Lincomb-water* near *Bath*, to have happened in the same space of time, and where likewise fresh air is observed to be generated hereupon.

Hence we may account for the following observation of *M. Macnamara*, Apothecary at *Atblone* (to whom the Public is indebted for most of the following histories of the Virtues of this water) who having filled several bottles at the well in *August*, opened them next *May*, and found that these tasted as strong and as good as when first bottled, and were perfectly clear and without sediment, *viz.* from the dissolution and re-absorption of the precipitated Ochre, which moreover I have observed to be separated and deposited again a second time, on such waters being exposed to the air,

It appears to contain but little foreign matter beside the Chalybeate; for it lathered with Soap in less than one minute, and it whitened but a little with Oyl of Tartar and Spirit of *Sul Ammoniac*.

I was assured by two persons who made the experiment, that when it was boiled, being taken up fresh from the fountain, with equal parts of Milk, it curdled the Milk: it had, however, no such effect here in *Dublin*, as indeed very few Chalybeates have, but rather preserve Milk from curdling: nor again did this water tried in *October* after the rains, curdle Milk on the spot: possibly this difference may be reconciled to truth by an observation of *Guidot* on the *Bath* water, *viz.* that in like manner, it being fresh drawn, curdles Milk, whereas, that which has been long kept has not that effect, the first retaining the volatile vitriolic Gas, which the second has lost.

Galls on the spot gave this water a light purple colour: to that which was examined in *Dublin* six days after being bottled, only a pink colour, which was very dilute, and but just sensible in the water which had been bottled seven days.

The mixture with Galls in the specimen sent to *Dublin*, on standing two or three days, exhibited a greenness at the surface, which gradually descended lower, an argument of Nitre; for this was not the case in the water tried at the fountain, but this mixture continued pale purple three days, the Nitre in the former case being more disengaged from the other parts.

The Analysis.

A GALLON exhaled left sixteen grains of a pale ochre-coloured matter, of a brackish and bitter taste; it fermented with Spirit of Vitriol; it was in some small parts attracted by the Magnet without previous calcination. It sparkled and smelt strong on the red hot iron.

Corol. It is a Chalybeate of considerable strength, impregnated also with a little Nitre; but to receive its virtues in perfection, recourse must be had to the fountain.

Its Operation is diuretic. It appears on trials made of its good effects for three years past since the year 1747, to be possessed of very considerable Virtues, and to have effected cures out of the reach of the common pharmaceutic medicines, viz.

1st, It has proved effectual in many instances in the cure of stubborn bloody fluxes, particularly in one of eight months standing in a woman aged sixty-five, who was perfectly cured on five days drinking of this water, sometimes with the Salts, but oftener without them.

A second person greatly emaciated by a Dysentery of nine months standing, was cured by drinking these waters

waters eighteen days. A third in the same disease, of above two years standing, was greatly relieved: and a fourth was cured of the same disease, of four years standing, by drinking these waters.

N. B. These effects are far from incredible, these waters, in common with other Chalybeates, being possessed of qualities entitling them thereto, viz. diluting the acrid juices, and corroborating the relaxed parts, whilst they divert the humors by urine; and accordingly the *Pymont* water, and several other Chalybeates, are eminent in this case; and that these good effects are not peculiar to this water, will appear in the next Section on the water of *Kilroran* (d)

Again, a Vomiting of blood was effectually stopt by the use of this water, which for several years used to return three or four times a year, but has now ceased these twelve months, and on further Observation it did not return in six years.

Nor are its Virtues in curing *Hæmorrhages* confined to the *primæ viæ*, but extended to other parts, v. g. An habitual uterine *Hæmorrhage* was cured by it, as was an *Hæmoptoe* in another, attended with Hectic flushings and sweats: and *James Begg* of *Aiblone*, above eighty years old, having for some years been afflicted with a severe Strangury, bloody Urine, and intolerable pain, was greatly relieved, tho' not thoroughly cured, viz. by drinking half a pint of this water two or three times a day, he obtained a great abatement of his pain and piss'd less blood.

E 4

2dly,

(d) If meer Water prove a powerful remedy in the cure of the Dysentery, as has been observed, it must be more efficacious when improved by the ferruginous impregnation; and *Dr. Stare*, in *Jones's Abridg.* of the *Philos. Transactions*, observes, that obstinate and inveterate Diarrhæas, have, by a judicious use of *Tunbridge* and other Chalybeates, received a cure; and we are assured by some of the best Authors on the Scurvy, that Chalybeate waters are excellent in inveterate Scorbutic Diarrhæas and Dysenteries.

2dly, A. C. had been afflicted with a *Diarrhœa* above fourteen months, and having taken great quantities of medicines prescribed by two Physicians to no purpose, was perfectly cured of it by this water, in fifteen days, drinking three, sometimes four quarts in a morning, and seldom using the purging Salts.

3dly, Accounts are given of Scirrhus, or at least hard tumors in the *Hypochondria*, and some of them of several years standing, resolved by drinking these waters; and it was observable, that one of these patients, agreeable to the experienced, successful method of drinking the waters of *Spa*, drank this water to the quantity of four, five or six quarts in a day, and the tumor vanished, and he recovered perfectly in four weeks: and in another of these instances it is said, that the waters of *Spa* and those of *Bath* had been drank without effect, but that the tumor (being a hard swelling, at the pit of the stomach, of several years standing) vanished on drinking this water.

Scholium. Let these accounts be compared with those of the following waters of *Kiiroran* (both no more than ordinary strong Chalybeates) and with those of the *German Spa*, (with all the essential properties of which our domestic Chalybeates are also endued;) and let our Physicians consider, whether the waters in their own neighbourhood may not be prescribed in these rebellious Obstructions, with a reasonable prospect of equal, if not sometimes superior success, to those of the *German Spa*.

4thly, This water has proved effectual in the cure of Scorbutic blotches and ulcers; particularly an Ulcer in the leg of several years standing, was cured in three weeks time by drinking the water, sometimes with Salts, but oftener without; and this patient drank sometimes four quarts in a morning.

M. L. aged forty-five, had been two years troubled with Blotches, attended with small Ulcers and a white scurf on the back of his hands and between his fingers, with

with great itching. Divers medicines had been used, particularly Calomel, *Æthiops*, and a decoction of the woods, to no purpose: then these waters were drank for five or six weeks, beginning with half a pint, and advancing to a quart, or three pints, and commonly purging with *Sal Glauberi* once a week; by which means, the cure was completed.

5. A person long afflicted with flat, white Worms, on drinking this water about a fortnight, voided near a hat-ful of them at once, and continued free from them after.

6. One grievously afflicted with the Gravel many years, of which he usually had severe fits nine or ten times a year, on drinking this water had but one fit for four years past.

S E C T. II.

KILRORAN Water near Mount Talbot

IN the same county of *Roscommon*, has been frequented and drank since the year 1743, and proved successful in some deplorable cases.

A gallon of the water was sent to *Dublin* in summer-time in bottles well corked and rozined, where the water was examined three days after being taken up.

It emitted plenty of bubbles sticking to the sides of the glafs.

It lathered smooth with Soap, but not without previous curdling: it exhibited a white cloud with Oyl of Tartar; a white-brown, and then purplish cloud with solution of Silver.

It made an ebullition with Oyl of Vitriol, and exhibited a subtile white cloud near the surface of the mixture.

It soon turned green with Syrup of Violets.

At

At the fountain Galls struck it of a deep claret-colour.

In the space of three days after its being bottled, it had deposited some of its Ochre, blackened the cork, retained the ferruginous taste but weakly, and it did not stink: it struck a dilute purple with Galls, which in a short space of time faded to an amber, and a blue with Logwood, which in four hours faded to a purple, so that the tinctures at a distance from the fountain are both far weaker and less durable than in those of the first Class, as *Granshaw* water, &c. for which reason I have placed it here, notwithstanding that it is possessed of considerable Virtues.

The Analysis.

A GALLON of it exhaled, left twenty-five grains of ochre-coloured sediment, which is of a brackish taste, ferments with Oyl of Vitriol, and more with Vinegar, sparkles on the red hot iron, turns slowly greenish with Syrup of Violets, and is not attracted by the Magnet until calcined.

The *Salt* separated from the other parts is a little bitterish, and melts in the air to a brown paste.

Corol. It is a Chalybeate of considerable strength at the fountain: its ferruginous parts are blended with an absorbent Earth and marine Salt, and probably a little Nitre.

Its Operation is by urine, being usually drank from a quart to three pints early in the morning.

Dr. *Hugh Fergus* of *Galway* having drank these waters for three seasons, deems them an excellent Chalybeate, and gives this further account of their good effects:

“ They are beneficial chiefly, first, in all complaints from a weakness or relaxation of the Stomach, in sourness of the Stomach, with Inappetency,
Flatus.

Flatus and vitiated digestion, for which there can hardly be a more effectual medicine.

They have cured beyond expectation inveterate obstructions of the Liver and Spleen, some aperient medicines being premised and taken during the use of the water; after which manner, having been continued five or six weeks, they have been known to have done wonders in confirmed Scirrhus's (*e*), as they have also cured some confirmed Dropsies, without any other addition than that of some doses of *Glauber's* Salt repeated now and then.

This water answers likewise the expectations of cachectic persons labouring under loss of Appetite, Oedematous Swellings and lowness of Spirits.

Several drink it for Flushings and red pimples breaking out in their Faces, and profess to have received benefit by it."

Dr. *Cuppaidge* gave me an instance of a Dysentery of several years standing, and which resisted other medicines, effectually cured by drinking this water. See the Accounts of the *Pymont* water in my larger Work, and that near *Atblone* in the foregoing Section, shewing that such an effect is not peculiar to this water, as neither is the deobstruent virtue of it, but in all probability common to other Chalybeate waters alike impregnated and drank at their fountains.

S E C T. III.

CASTLECONNEL Water,

NEAR *Limerick*, is in considerable repute, and pretty much frequented.

The Soil about it is said to be of a calcarious Nature.

It

(*e*) Compare the Accounts of the *German Spa*, and of the Chalybeate of the last Section, and of *Tralte* water.

It is of a ferruginous and astringent taste, and as light as the *German Spaw* (f).

It is not altogether so pure a Chalybeate as many others of this country, but has more mixture of a foreign matter; for it curdled with Soap, not lathering without difficulty, and it turned whitish with Oyl of Tartar and Spirit of *Sal Ammoniac*, and bluish with the last at the fountain, which my ingenious Correspondent *Sylvester O'Halloran*, Surgeon at *Limerick*, imputes to Copper, a conjecture not altogether improbable, but which seemed to be confirmed by the following experiment: he kept a knife three hours immersed in the well, and it came out of a blackish colour, and the back and sides of it were partly of a Copperish-colour; and I have elsewhere hinted, that it's probable some small mixture of Copper may attend many of our Chalybeates.

Again, he kept Silver immersed two days in the well, which suffered no change save that it became a little yellowish, which might be rubbed off, which he inclines to impute to Ochre, but I rather to some little Sulphur, of which I reckon few of our Chalybeates to be wholly destitute.

But to return to the experiments usually made with the *Precipitators*, this water exhibited a gross white cloud and some sediment with solution of Sugar of Lead: and some of the water which had been kept above six months turned whitish, and then of a pink-colour with solution of Silver.

Oyl of Vitriol and Spirit of Salt gave plenty of small bubbles, indicating an alkaline Earth.

Milk mixed with this water keeps longer without turning sour than without it, so that a Milk-diet is very consistent with the use of this, as indeed most other Chalybeates.

Syrup of Violets and Syrup of Cloves turned the
water

(f) *Martin's Essay on Castleconnel Water.*

water both at the fountain, and that which had been seven days taken up of a pretty deep green.

Galls mixed in a very small quantity with this water at the fountain, turn it very soon of a dark claret-colour, however this colour is not long retained; and if the water be kept twenty four hours, the Galls will not strike it purple, but of the colour of ale, nor will the same powder of Galls produce any effect on the water just warmed.

Nevertheless the following observations shew that it has a power of recovering it self after long keeping, and in such a manner, *viz.* without fetor, as wou'd induce one to think it might be usefully transported to remote places, *viz.*

July 23, 1742. I received a specimen of it which had been bottled seven days before: it had a strong ferruginous taste and smell, and was not fetid: it also struck a dilute purple with Sumach, and a pale blue with Logwood, which however it did not retain, but became red on standing, otherwise than the Chalybeates of the first Class which hold their tinctures much longer.

Again, April 15, 1743, some of this water which was left in *Dublin*, and had been bottled above six months, had precipitated some of it's Ochre, was clear and sweet, of a strong ferruginous taste, struck purple with Galls and a deep blue with Logwood, which continued deep also twenty hours after, but faded to a brown in forty eight hours.

The Analysis.

1. *Spontaneous.* An ochre-coloured matter in about the proportion of a grain to a pint is precipitated, which in a red hot crucible sparkled, grew red, and was attracted by the magnet.

2. *Artificial.* According to Dr. Martin a gallon yielded fifty-three grains of sediment; *Silvester O'Holloran* obtained not above twenty four grains from the same

same quantity, and I only fifteen grains, *viz.* of a pale brown substance, of a brackish taste, which sparkled and smelt strong on the red hot iron, made a considerable ebullition even with Vinegar, an ebullition and smoak with Oil of Vitriol.

Corol. It is a Chalybeate of considerable strength, but not purely such, having a mixture of absorbent Earth and marine Salt.

An Earth-worm put into this water instantly dies.

It passes quickly by urine, and many find themselves warmer after it, and some giddy or inclined to sleep.

It has been long experienced to be excellent in all scorbutic disorders, and where the stomach has been weaken'd by excess; and a signal instance occurred lately of it's efficacy in an habitual indigestion and vomiting.

N. B. The seven following waters it shall suffice to give only a cursory view of, and refer to the Table for a more minute account, the chief design of specifying them here, being to establish what is above affirmed concerning many of these waters, *viz.* that by Putrefaction they redissolve and absorb their precipitated Ochre, resuming their lost ferruginous taste and property of colouring with Galls (*a*).

S E C T. IV.

ARDMILLAN Water,

SITUATE in the barony of *Castlereagh*, about midway between *Killileagh* and *Newtown* in the County of *Downe* (*b*).

Having

(*a*) See the Section on the *Dunse Spa*, in my larger Work, for further satisfaction in this point.

(*b*) Ancient and present State of the county of *Dowen*.

Having been three weeks taken up in *June* 1742, when examined in *Dublin*, some bottles of it stunk (but gave no tincture to Silver (ϕ) or Gold immersed) and were entirely clear, with a strong ferruginous taste, viz. having absorbed their precipitated Ochre; for other bottles had an ochry sediment; it (viz. in *Dublin* at the distance of time above mentioned) struck a deep pink-colour with Galls, and a red with Log-wood.

Acids made little ebullition, and Alcalies caused very little precipitation; and soap lathered smooth with it; but solution of Silver exhibited some white yellowish grumes.

The Analysis.

A GALLON yielded eight grains of a brown ochre-coloured matter, which was of a very brackish taste, and grew damp in the air.

Corol. It is a comparatively pure Chalybeate, with a little marine Salt, and shou'd be drank at the fountain.

S E C T. V.

GARDONNEL Water,

SITUATE about three miles *W. N. W.* of *Newtown* in the County of *Downe*.

It was examined in *Dublin* some weeks after being taken up, when it was wheyish, very fetid, and of a ferruginous taste, but had no ochre at the bottom, having reabsorbed it by putrefaction.

It gave a deep claret-colour with Galls.

F

The

(*b*) The same Observation holds in several other Chalybeates, viz. that altho' they become putrid, they do not tinge Silver or Gold, as those of *Traler*, and of *Dunse* in *Scotland* do, these last manifesting more evidently a combination of sulphur with their iron.

The Analysis.

A GALLON yielded about twelve grains of sediment, partly Ochre-coloured, and partly white.

Corol. It is a comparatively pure Chalybeate and should be drank on the spot.

S E C T. VI.

DROMORE Water,

SITUATE in *Dromore* town by the river side. It is of a strongly ferruginous taste on the spot, which, having been bottled six weeks before, and sent to *Dublin*, it retained and stunk.

In one experiment, it appeared to be a soft water, lathering with Soap; but in a dry season it curdled with Soap, and imparted a redness to Beef.

On the spot it gave a very deep purple with Galls, and what had been six weeks bottled gave a purple-colour.

The Analysis.

A GALLON of it taken up in a dry season left twenty four grains of a brown ochre-coloured sediment, of a brackish and bitterish taste, and which grew damp in the air, and fermented with Vinegar.

Corol. It is a less pure Chalybeate than either of the two last, and has a mixture of Nitre and marine Salt with the Ochre, in a somewhat greater quantity than many others, whence it's operation is sometimes by stool, and it has been experienced successful in the Gravel.

S E C T.

S E C T. VII.

TIERKELLY Water.

IS situated two miles N. E. from (a) Rathfriland in the county of *Down*, near the edge of a bog.

On the spot it was of a ferruginous taste, and withal very harsh, which taste it retained strongly, when it arrived in *Dublin* seventeen days after, tho' it was fetid withal, yet did not tinge Silver immersed in it, and the bottles were void of any ochreous sediment, so that here also the precipitated Ochre has been reabsorbed by Putrefaction.

It lathered smooth with Soap, without any previous curds, and continued clear with Oyl of Tartar.

At the fountain it struck a claret-colour with Galls : after having been seventeen days bottled, it had blackened its Cork as if dipt in ink, and it struck a pale claret-colour with Galls, and a deep blue with Logwood, and both these tinctures held forty-eight hours.

The Analysis.

It spontaneously throws up to the surface, a very thick, blue scum, and on exhaling a white bluish scum; and a gallon yielded eleven grains of a brown sediment, which was attracted by the Magnet without previous calcination.

Corol. It has all the appearances of a rich Chalybeate, (tho' it does not bear carriage well) for tho' it has less contents than many other Chalybeates, yet these are more purely ferruginous, and less blended with calcarious Earth and Nitre.

It sometimes purges by stool, and has proved very effectual both by external and internal use in the cure

F 2

of

(a) Ancient and present State of the county of *Down*.

of persons over-run with Blotches and Scabs : and no doubt is equally applicable to as many good purposes in medicine, as any other alike impregnated Chalybeate which has happened to be more amply experienced, and so recommended in more numerous cases.

S E C T. VIII.

GORCUMCAUL Water.

IS situated about seven miles W. from *Letterkenny* in the county of *Donegal*.

It arrived in *Dublin*, where it was examined three weeks after its being bottled, when it had the ferruginous taste, and was somewhat fetid : it soon lathered with Soap ; it had blackened its Cork and struck a deep red with Galls, which tincture it held with little variation, seven days.

The sediment spontaneously deposited, being dried, sparkled and flamed, and smelt strong on the red hot iron.

Corol. It has the appearances of a strong Chalybeate at the fountain, and withal a comparatively pure one.

S E C T. IX.

BANDON Water,

IS situated at a small distance from the Church at *Bandon*, in the county of *Cork*, near the bank of *Bridewell-river*, and in floods is liable to be overflowed (a).

It

(a) *Smith's natural and civil History of the county of Cork.*

It is of a ferruginous taste, almost like Smith's forgewater, and on being kept in a bottle for the space of a week or more, it stunk.

In this last mentioned state, Oyl of Tartar and Spirit of *Sal Ammoniac* gave no evident precipitation with it; and Soap lathered with it, tho' not immediately: and Oyl of Vitriol and Spirit of Salt caused no ebullition with it, but the mixture grew very limpid: hence it has very little calcarious Nitre or Earth.

On the spot it struck purple with Galls: on its arrival in *Dublin*, in about a week's time, it struck a pretty deep purple with Galls, and a deep blue with Logwood.

The Analysis.

THE Ochre-coloured matter spontaneously deposited, flamed on the red hot iron.

A gallon yielded fifteen grains of a snuff-coloured sediment, which, without previous calcination, yielded partly to the Magnet, was of a brackish and bitterish taste, fermented and emitted a penetrating fume with Oyl of Vitriol, and grew damp in the air.

Corol. It is a comparatively pure Chalybeate, and of considerable strength, and has a pittance of marine Salt combined with its Ochre.

It is reported to have been successfully used in loss of Appetite, pains of the Stomach, Swellings of the Legs, and in the Scurvy.

SECT. X.

CLONMEL Water,

IS situated half a mile S. E. from the town (a). On its arrival in *Dublin* six days after its being bottled, in summer time, it retained the Chalybeate taste and stunk a little, but exhibited no ochreous subsidence,

F 3

(a) *Smith's natural and civil Hist. of the county of Waterford.*

sidence, having probably by Putrefaction reabsorbed the precipitated Ochre.

It lathered smooth with Soap, continued clear with Oyl of Tartar *per deliquium*, and gave only a small subtile cloud with solution of Sugar of Lead: it made no ebullition with Oyl of Vitriol, nor greened Syrup of Violets; all arguments of a comparatively pure Chalybeate.

Galls on the spot struck it of a purple colour, as also on its arrival in *Dublin*, in the somewhat putrid state above mentioned.

The Analysis.

It affords a thick, white and yellow scum: and a gallon gave ten grains of a dark brown powder, of a brackish taste.

It proves mostly diuretic, and has been drank with considerable benefit in the Scurvy and in Cachectic cases.

N. B. The four following springs from the mountainous parts, to the southward of the county of *Dublin*, are placed together here, in order to shew that no certain conclusion is to be drawn from the depth of the tincture yielded by Galls from any Chalybeate water, of its absolute strength, or at least of the degree of intimacy of the dissolution of the ferruginous particles in the element, because, (altho' the tincture be weaker, and more slowly struck) those are kept remarkably longer suspended in these than in several waters that give stronger tinctures, and moreover these retain their property of tinging with Galls longer.

S E C T. XI.

KILMASHEOG Water.

THE spring was first taken notice of about the year 1748, being, in my opinion, superior to that

that of *Templeoge*, even when this last was in its utmost perfection, tho' not so easy of access.

It is a perennial spring about nine inches deep, and about twelve inches over, situate in a small Glyn on *Kilmasbeoge* hill, a mile S. from *Kilmasbeoge*, and five miles from *Dublin*, and consequently, *Templeoge* Spring now failing, is the nearest of any to the City, and not unworthy the notice of our citizens, who, tho' probably by the badness of the road, they may be deterred from going to the fountain, may be daily supplied in summer with this water conveyed to them early in the morning in bottles well corked, and so it deserves a cover from the rain. It is not overflowed but in great floods.

The white, bluish scum on the brook near it, here and there, a kind of ferruginous liquid trickling down the banks in some places, and a ponderous black stone found in the neighbourhood, consisting of Iron-mine incorporated with Firestone-gravel, point out the quality of the impregnating mineral.

It is of a pretty strong ferruginous, or inky taste, and withal of a light bitter in the throat, on the spot; and when brought to *Dublin* in the cool of the morning, it retained the taste almost as strong as at the fountain, and moreover evidently retained the ferruginous taste twenty-four hours after being taken up.

A bottle of it well corked, made an explosion upon opening, and exhibited small bubbles on the sides of the glass.

It lathered smooth with Soap, without any curds: it gave a dilute pearl-colour with both the Alkalies, and with solution of Silver a pink-colour at the fountain, and a pearl-colour on its arrival in *Dublin*.

It caused no ebullition with Spirit of Vitriol, nor *Aqua fortis*.

Syrup of Violets turned it greenish, both at the fountain and in *Dublin*.

The blue circle on the surface of an infusion of Ash-bark was not destroyed (as the tincture of *Lignum Nephriticum* was by the *Dunnard* water) on the spot, by adding this water to it immediately from the fountain, but became of a deeper blue, and consequently the acid is less manifest here.

Milk boiled with equal parts of it on the spot suffered no coagulation.

Galls on the spot strike it of a dilute claret-colour, not so quick, nor indeed so deep as *Templeoge*, and many others of the third Class used to do, but more slowly; but then it retains this tincture, and the power of giving it much longer: for it gave a dilute pink-colour when it had been kept twenty-four hours, and even after three days it tinged, tho' but weakly.

It also struck blue with Logwood, and it retained both this tincture, and that from Galls above three days; and moreover it retained an amber tincture from Galls in an open glass above fourteen days: Thus it resembles the *Hampstead* water near *London*, and differs from the *Islington* and our *Templeoge*, and others of the third Class, whose tincture from Galls ordinarily fades in a few hours or less time.

Are not these two circumstances (*viz.* what has been observed in the two preceding paragraphs) worthy of attention, as they seem to shew a more intimate dissolution, and consequently less easy separation of the ferruginous matter?

I observed this water to be of the strongest taste, and to strike the deepest tincture with Galls upon rain succeeding long drought, tho' upon long continued rains it became very weak, and scarce gave any tincture with Galls, and long drought has much a like effect as long rains.

I tried *Hales's* experiment of mixing one of the mineral acids with it, in order to preserve its ferruginous quality, and found that twelve drops of Spirit of *Vitriol* to a quart, prevented the separation of the *Ochre*,
and

and preserved the ferruginous taste entire for a week when I opened it, and doubt not but it wou'd have kept it much longer.

This experiment may be of great use to preserve the water for several days, when thro' badness of weather or otherwise, it may not be practicable to go or send to the fountain every day; and when the Importation of the foreign waters fails us, as it sometimes does, we might in this manner be supplied nearer home with a *Succedaneum* perhaps not much inferior.

The Analysis.

1. *Spontaneous.* It throws up a reddish and white-bluish scum, and tinges the channel of a reddish brown.

The *Delft* mug out of which I usually drank it, was covered with a dark brown crust at the bottom and sides, into which an infusion of green Tea being poured, acquired a black colour; from whence we may learn that those Vitriolic parts which give the water the power of tinging purple or black with astringents, do not all fly off, but are, assuredly in part precipitated.

The sediment spontaneously deposited, being dried, was in some small parts, attracted by the Magnet, and sparkled and smelt strong upon the red hot iron: and

Being calcined, from a brown ochreous, it became of a much redder colour, and fled almost wholly to the Magnet.

2. *Artificial.* A gallon yielded about eight grains of a brown *residuum*, which also smelt strong and sparkled greatly on the red hot iron, was of a brackish taste, and moistened in the air, fermented a little with Spirit of Vitriol, and was attracted a little by the Magnet without previous calcination. It turned green with Syrup of Violets, and emitted a somewhat pungent smell when rubbed with *Sal Ammoniac*.

Corol. It is a comparatively pure Chalybeate, of a moderate degree of strength.

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An Earth-worm, if it chance to drop into this well, soon grows pale, languishes and dies.

I tried the effects of this water on myself for three seasons, beginning A. D. 1749.

Having for the most part enjoyed a good state of health, excepting some slight scorbutic and rheumatic complaints in my youth; of late years, after long application to my studies and practice in the city, and want of air and exercise, about the 50th year of my age I fell into a dejection and sometimes such a weakness of Spirits, that I could not fix my attention to one particular object; with vain Terrors, Tremors in the eyes and depravation of Sight: beside this, an habitual Flatulence attended, and lately frequent Bleeding from the gums.

I drank for the most part three pints every morning, (sometimes adding a little *tinctura aromatica* to the first glass) for the space of six weeks or two months, for three summers successively, the last of which was very moist and cold, and unfavourable to a course of this kind: I also sometimes interposed the use of riding.

It passed off quickly by urine, and in hot weather partly by sweat. I soon experienced a remarkable alacrity and a voracious appetite, and had very little return of any of the symptoms mentioned, to any degree since, to the end of the year 1751.

During the course, I observed now and then what we commonly call a blind Boil or two, contrary to custom, and sometimes flying pains in the joints more than usual, and some slight appearance of an Hæmorrhoid, which I had not felt for many years before; and the third year I had an unusual itching in my hands, all evidences of the activity of this water, as perhaps was the following fact of its bracing quality in common with other Chalybeates, and of its diverting the course of the humors another way, viz. my Gums become less liable to bleed.

At

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At the end of the course the third year, I observed a large quantity of fabulous sediment in my urine, and which stuck to the pot, tho' I had not ever been troubled with any symptoms of the Gravel; but I must say, my flatulence continued invincible, being perhaps hereditary; and one observation more may not be unworthy the notice of some of the drinkers of these waters, as shewing the impropriety of flatulent foods especially in like circumstances during a course of this nature, *viz.* in two of the above mentioned seasons a dinner of *Beans* during my use of this water, gave me a palpitation of the Heart, with an unusual anxiety and confusion in the head.

I did not observe any blackness of stools during my drinking this water, as is usual in the *German* and several of our own stronger Chalybeates.

To this it may not be useless to annex an instance of a misapplication of this water: an hypocondriack man, greatly distressed with flatulencies and gouty withal, and in the decline of life, *viz.* at the age of fifty seven, took this water in summer 1753, and tho' he added a dose of Chalybeate wine to the first draught, it always distended his belly, and never passed freely; but the use of wine and more generous liquors gave him the gout and lessened his other complaints.

That it has powerful effects in restoring lost appetite and digestion may appear from the following instance: *Muldowney*, a farmer resident at the place, aged sixty, had been for some years, after an inveterate Ague, troubled with pains of the Limbs without tumor, as also with loss of appetite and complexion, and he used to be extremely sick after a little debauch, so that he became temperate by necessity; but was very infirm withal.

He drank these waters for three weeks or more for several summers; his pains are much abated, and he has so far recovered his appetite and digestion, that he can now, *more patrio*, drink largely and sit up late
at

at nights without the usual subsequent sickness; one instance among too many more, of a physical good perverted to a moral evil.

S E C T. XII.

AUGH FARREL Water,

IS situate on the mearing between the county of Wicklow and Dublin 8 $\frac{1}{2}$ miles S. W. from Dublin, and 3 $\frac{1}{2}$ miles from Blessington, on the lands of Alexander Carleton, Esq;

It springs out of the bottom of a mountain: the neighbouring soyl is slatey, and iron stones are frequent here. Adjacent to it is a bog, the turf whereof is called *Moen-brown* or stinking turf, being solid and black.

The spring yields plenty of water, and at present lies open to the weather, but it deserves a cover, being of a pretty strong Chalybeate taste at the source, and withal subastrigent and bitter in the throat.

It's comparative purity is manifest from the following experiments: it lathers smooth with Soap without any curds: it is clear with solution of Salt of Tartar, and yields a fine light blue tincture, and a small sediment of the same colour with solution of Silver: Oil of Vitriol and spirit of Salt made but a very minute ebullition with it.

Galls gave it a pink-colour, and Logwood a deep blue at the fountain; and it continued to strike both these tinctures twenty four hours after it had been taken up, so that this water, like that of the preceding Section, tho' it gives a weaker tincture with Galls, than that of *Islington*, or *Templeoge*, and several others of the third Class, yet it retains the property of colouring with Galls much longer, tho' in comparison of the Chalybeates of the first Class it retains that property but a little while; for when this water had been kept

forty

forty eight hours in a flask well corked and waxed, it had nearly lost all it's ferruginous taste, nor did it any longer strike any tincture with Galls.

Nevertheless, by means of a few drops of the mineral acids added to each flask, this, as well as others of this second and of the third Class, may be preserved many days, or even months, with their ferruginous quality and property of colouring as above with Galls, entire, as at the fountain head: and such addition of the acid serves only to keep the ochre suspended without impairing the virtues of the water when used in this small quantity.

Corol. It is a comparatively pure Chalybeate.

It has been observed to pass quickly by urine, and was used medicinally forty years ago.

S E C T. XIII.

A Water near ENNISCORTHY,

BEING situated within half a mile of *Enniscorthy* in the County of *Wexford*, on the west-side of the river *Slane*, and about midway between *Enniscorthy* and the village of *St. John's*.

At the fountain it manifests a considerable degree of strength, but it does not bear heat, nor to be kept many hours without losing it's ferruginous quality.

A specimen of it filled *July 25*, at four in the morning arrived in *Dublin July 29*, 1751, by the care of *Francis Wheeler* of *Enniscorthy* in a wet season.

He also sent me another specimen in dry weather in *October 1754*, carefully filled and bottled, which arrived in *Dublin* in three days, which in most or all experiments exhibited the same appearances as the other specimen sent in a wet season.

Out of the four bottles sent to me, one only had a musty and ferruginous taste, and struck a pink-colour with Galls, (which was also the case in the bottles of the

the second specimen examined three days after being filled) the rest struck no tincture with Galls at all, tho' several of the Corks were blackened, and in the second specimen the Corks were as black as from ink; but tho' the tincture that single bottle gave with Galls was weak, it was very durable; for it held the tincture received without change above a fortnight, far otherwise than happens to *Issington*, *Templeoge*, and other waters of the third Class, for which reason I have annexed it here.

That it is a comparatively pure Chalybeate appears from the following experiments: it lathered with Soap without previous curdling: it was of a dilute pearl-colour with solution of Potashes: it continued blue with Syrup of Violets; Spirit of Vitriol caused no ebullition with it: solution of Silver exhibited some small grumes.

The Analysis.

It throws up a white-bluish and reddish scum, and it's channel is of a yellow-brown ochre-colour.

A gallon yielded ten grains of a pale-brown sediment, of a brackish taste, and which in some small parts, without previous calcination fled to the magnet: rubbed with *Sal Ammoniac* it smelt strongly pungent and fetid, and a little pungent when rubbed with Salt of Tartar: it soon greened with Syrup of Violets. It sparkled and stunk on the red hot iron, and in the second specimen flamed.

Corol. It seems to be one of those waters wherein the ferruginous parts are more intimately dissolved, and is a comparatively pure Chalybeate, save that it appears to have a little *Natron* combined with the iron.

It is observable, notwithstanding the sparingness of the impregnation with either Iron or Salts, that it frequently gives a stool or two when drank at the fountain at first using.

It should be drank at the fountain, where it has lately relieved several persons in loss of appetite and various disorders; particularly my Correspondent, a middle aged man, who in consequence of a neglected gout falling into cholic pains, inappetence and a retching to vomit, was greatly relieved by drinking these waters; and whereas he had been troubled with large round Blotches of a leprous kind on his hands, elbows and legs, which almost covered the backs of his hands, and rose to a thick dry white scurf which scaled off, and then left a redness until the scurf appeared again, his skin was almost cleared by drinking these waters one season, and in the beginning of June 1752, those Blotches making a little appearance again, he repeated the use of the waters, interposing now and then a purge of the *Sal catharticus Glauberi*, whereupon he was almost, tho' not quite cured, he not being altogether regular in drinking the water, and moreover it is observable in several of these cases that a repetition of the waters for some seasons successively is necessary to a compleat cure.

Other disorders of the skin among the poor, which by the description approached more to the nature of a common Itch, were also cured by drinking this water.

S E C T. XIV.*GARRYDUFF Water.*

THE Spring is situated near the top of a mountainous bog called *Garryduff* about a mile and a half S. from the *Breaks* of *Glanasmole*, five miles from *Templeogue*, and eight miles S. W. from *Dublin*.

It's taste is ferruginous, both at the fountain and twenty four hours bottled.

It lathered smooth with Soap without any curds.

When it had been eighteen hours taken up, it struck but pale pink-colour with Galls, viz. much weaker than

than many of the third Class; but the tincture it struck was much more durable, lasting for a week or more, not suddenly fading as in those.

The Analysis.

A Gallon of it left twelve grains of a dark brown sediment, whereof some parts fled to the magnet without previous calcination. It sparkled and stunk a little on the red hot iron; rubbed with *Sal Ammoniac* it smelt a little pungent and fetid.

Corol. It is a comparatively pure Chalybeate.

It's use in medicine is not known, but it is used by the labourers in summer for their common drink.

SECT. XV.

GLANCULLEN Water.

ON the top of *Glancullen* mountain, two miles W. from *Powerscourt* is a perennial spring of this sort; but it is of so difficult access, so exposed to the weather and weakened by other water mixing with it, that it would be scarce worthy of notice but for sake of the following appearances, conspiring with those recited of the waters described in the three foregoing Sections in evincing the same thing, viz.

It gave only a weak shade of purple, at the fountain, which however it continued to do eighteen hours after it had been taken up, and a gallon of it yielded ten grains of a snuff-coloured sediment much more strongly and purely ferruginous than that of *Templeoge*, being a little attracted by the magnet, even before calcination; but after calcination it fled almost wholly to the magnet; also it flamed a little in the red hot crucible, which flame in one experiment was bluish.

SECT.

S E C T. XVI.

CURTLAGH Water.

IS the strongest Chalybeate of this Class I have met with in the County of *Dublin*; and in defect of the *German Spa* water, might be conveyed to *Dublin* every day in the proper season, in the cool of the morning, with very little diminution of it's virtues: it has been known many years, tho' not much drank, but by a few in the neighbourhood, or in places not very remote from it.

It is situated about a quarter of a mile W. from the *Man of War Inn*, at the village of *Curtlagh*, on *Thompson's Farm*, in the Barony of *Balruddery* and county of *Dublin*, about twelve miles from the city, in a kind of declivity in a mountainous country.

There is plenty of iron stones in the neighbourhood, and it is said that great quantities of iron-mine have been taken up near it,

On the spot it was of a strongly ferruginous taste, and exhibited plenty of air-bubbles on the sides of the glass. I am assured that it did not freeze in the great frost in 1739-40.

A bottle of it carefully corked and rozined on the spot, being opened fifteen hours after, retained the ferruginous taste strongly, as it did also when exposed six hours in an open glass, and as did likewise a bottle of it left half empty thirty-nine hours: in another trial a bottle of it well corked retained the ferruginous taste 48 hours.

By comparing this account with that of *Dunkard* hereafter, this appears to be considerably the stronger of the two, and consequently, besides the advantage of it's greater nearness to the city, promises to bear carriage thither with less injury.

The following experiments seem to shew that here is

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but

but little mixture of foreign matter with the ferruginous, viz.

In one experiment it lathered with Soap, tho' not smooth, but in another it lathered without any previous curds: Oil of Tartar and Spirit of *Sai Ammoniac* gave a small ochreous sediment; Syrup of Violets exhibited a greenness only at the surface of the mixture: the blue tincture of Ash-bark was heightened considerably by adding a little of this water to it on the spot. Oil of Vitriol made only a little ebullition with it: indeed the solution of Silver exhibited a gross pearl-coloured sediment, which, after a while became quite blue, (in another experiment purple) whether an argument of some pittance of Sulphur or Nitre I determine not.

Milk boiled with equal parts, and even a double quantity of the water on the spot, suffered no coagulation.

On the spot it struck a deep claret-colour with Galls, as it did also fifteen hours after in *Dublin*, and a blue with Logwood, and it retained both these tinctures lively forty hours; and a bottle left half empty thirty-nine hours after being filled, did also presently strike purple with Galls, in another experiment it gave a dilute pink-colour with Galls, when it had been kept fifty-one hours, and a blue with Logwood, but the first soon faded to an amber, and the last to a muddy green; however when kept three days it had made a considerable precipitation, had almost lost the ferruginous taste, and gave but a faint shade of purple with Galls, and not a blue, but only a red with Logwood:

But if a proper proportion of the mineral Acids, v. g. three drops of Oil of Sulphur be mixed with a quart of the water at the fountain, it may be preserved a much longer time.

Scholium. It is highly probable, that an *Acidum vagum* in the bowels of the earth is the natural solvent of the ochreous or ferruginous matter; for in the experiments

experiments made with the mineral acids for preserving these waters, this matter is kept suspended, which would otherwise be precipitated in form of a sediment, as we shall elsewhere see that an Acid added either to the sediment, or to the scum of Chalybeate waters, has restored unto them the lost vitriolic quality.

The Analysis.

It throws up a light bluish scum to the surface, and the channel is of a reddish ochreous colour.

A gallon of it in exhaling threw up a white shining scum, and left thirteen grains of sediment, (and so in a second trial) of a snuff-colour and brackish taste, and which grew damp in the air, made a minute ebullition with Vinegar, and sparkled on the red hot iron a little, but smelt strong.

Rubbed with *Sal Ammoniac* it smelt somewhat pungent, and with Syrup of Violets turned of a muddy olive-colour.

Corol, It is one of the strongest Chalybeates of the second Class, and seems to have a pittance of marine Salt combined with it's iron; but altho' it be one of the strongest of this Class, it however falls greatly short (with respect to it's retaining it's original qualities at a distance from the fountain) of those of the first Class, as will abundantly appear by comparing this, and the series of experiments above given on the waters of the first Class.

It is said to be opening by urine, but binding by stool, and to have been effectual in curing some Loosenesses and Colicks, and that many in Dropsies have been greatly relieved by it.

S E C T. XVII.

G A R I S T O W N E Water.

IS situated in the town of this name, about twelve miles from *Dublin* in the county of *Dublin*, and on

the borders of the county of *Meath*, and is of some reputation in medicine, being sometimes sent to *Drogheda*, about six miles from it, in pitch'd bottles; and by the addition of a few drops of a mineral Acid to each bottle, as in the last described water, might bear carriage also to places more remote.

In the neighbourhood, besides the Turf dug here, is *Ochre*, and Quarries of a *blue rotten Stone*, which I found, on exposing to the air, to be a *Minera* of *Vi-triol*.

It yields a pretty large supply of water. It has no other shelter from the weather than the branches of trees growing over it, but deserves a better cover; and I observed some little streams of common water to mix with it and weaken it, which might, and ought to be, diverted; and if so, it wou'd be much stronger than it is: for, notwithstanding this disadvantage, it was of a taste pretty strongly ferruginous, subastringent, and bitterish in the throat.

On the sides of the glass some bubbles were formed.

It seems to be little more than pure Element impregnated with Iron, or its *minera*, *Ochre*: for Soap lathered smooth with it, without any curds, and Oil of Tartar exhibited only a subtile bluishness: it is also very light, for the Hydrometer stood in it at $6\frac{1}{4}$ in a cold, winter-like season.

It struck a dilute purple with Galls at the fountain, and a bright blue with Logwood; but when conveyed to *Dublin*, and examined there twenty-seven hours after, it had but little taste, nor did it strike at all purple with Galls, tho' a small shade of blue with Logwood.

The Analysis.

1. *Spontaneous.* It throws up a variegated scum, white, blue, red and green.

2. *Artificial.* Exhaled it yielded from a gallon, about eight grains of grey sediment, which burnt obscurely

scurely reddish, and yielded in some small parts to the Magnet, and fermented with Spirit of Vitriol.

Corol. It is a pure, light Chalybeate, of use chiefly at the fountain.

It is Diuretic: it was of service to a certain old man in the Diabetes, and to another in the Gravel, virtues common to this with other Chalybeates.

The People of the town frequently boil their meat in it.

S E C T. XVIII.

The Water of GLANMILE near Naule

IS situated in a *glyn* among the hills, near *Naule*, a little to the westward of *Westowne*, and about a quarter of a mile S. from *Garistowne* bog.

August 26, 1746, it yielded a great supply of water, which was of a strongly ferruginous and bitterish taste; but in a drier season in *July* 1748, the irony taste was weaker. It retained this taste next morning, but it became very weak thirty hours after being bottled.

It lathered smooth with Soap without any curds.

Galls at the fountain struck it of a claret-colour, and twenty hours after its being bottled, of a pale pink-colour; but when kept three days, it had lost all power of tinging with Galls, and precipitated its Ochre.

The Analysis.

A GALLON yielded from ten to twelve grains of a brown Ochre-coloured *residuum*, of a brackish and bitterish taste, with an odd flavour: it fermented with Spirit of Vitriol, grew damp in the air, sparkled and smelt strong on the red hot iron, and was a little attracted by the Magnet, even without calcination.

Corol. It is a comparatively pure Chalybeate, of a moderate degree of strength, which to obtain in perfection, it's necessary to have recourse to the fountain.

An authentic instance was given me of a stubborn and inveterate Ulcer in the arm cured by drinking this water, and bathing the part with it.

It seems worthy of notice that the *glyn* in which this spring is found, abounds with a rotten *Irish Slate*, which is of the mildest kind, or of the least degree of acidity I have observed, being of a very mildly acid, and sweet-austere, or vitriolic taste; and water poured hot upon it acquired a strong sulphureous smell, and struck partly purple and partly blue with Galls, the characteristick of martial Vitriol: I moreover observed a rock of this slate to yield a Nitrous efflorescence, as do likewise several stones of the like kind in the neighbouring country, which also by decoction yield a calcarious Nitre.

Scholium. It is probable that a Mineral like our *Lapis Hibernicus*, may, according to its different degrees of acidity, be one principal Mineral impregnating divers of the waters called Chalybeate and Vitriolic, so that where it is strongly acid it may constitute the acid Vitriolic waters, and where weakly acid, or where combined with calcarious matter, it may constitute the ordinary Chalybeates.

The unctuousity and slight bitterness observable in several of the ordinary Chalybeates, however agree to such a mineral as the stone above described in the neighbourhood of this water, which beside the solar earth and Vitriol, yields also calcarious Nitre. Compare with this, what is observed in the History of the Chalybeate of *Lis done varna* in the county of *Clare*, and of that of *Ballyspellan*.

N. B. The eleven or twelve following waters do for the most part evidently betray a mixture of Sulphur with their Iron; I have observed the same thing
of

of several also of the first and third Class, and do strongly suspect that many more, if accurately examined; would manifest the same combination: and indeed, perhaps few or no Chalybeates are wholly void of Sulphur.

S E C T. XIX.

S H A N K I L Spaw.

I annex this water here by reason of its vicinity to the Metropolis, being situated in the county of *Wicklow*, on the town-lands of *Shankil*, lately belonging to *Henry Bond*, Esq; who first discovered it, (now to *Thomas Coote*) and bordering on the county of *Dublin*, about four miles E. from *Blessington*, a mile S. W. from *Dugb-farrel Spaw*, and eight W. from *Dublin*, in a glin beyond *Butter-mountain*, on the back of *Tallow-hill*.

It is a simple Chalybeate, but a strong one, being one of those that retain their power of tinging with Galls for a very considerable time, as appears by the following observations.

The water having been taken up from the fountain the 21st of *April* 1753, in the morning, was examined at five in the evening of the same day, when its taste was strongly ferruginous, and it struck a claret-colour with Galls: it was clear with the depurated solution of Potashes, and lathered with Soap: it turned bluish with solution of Silver, and scarce gave any sediment: it had blackened the Corks. It retained the ferruginous taste, even to the third day after bottling, when also Galls struck it purple, and the tincture continued long, and Logwood an obscure blue, which on standing became a deep blue; but on the fifth day it lost all ferruginous taste, nor did it any longer strike purple with Galls, or blue with Logwood; but in a trial in *May* 1756, it did not retain the ferruginous

taste and power of striking purple with Galls strongly above two days.

The purple tincture, struck with Galls as above, was very permanent, abiding without sensible fading for a week.

The Analysis.

THE proportion of a gallon yielded five or six grains of an ochre-coloured matter, which, even in its crude state, was attracted by the Magnet, made no sensible ebullition with Spirit of Vitriol, and but little with Oil of Vitriol, was of a somewhat brackish taste, and sparkled and flamed a little on the red hot iron.

I evaporated the same quantity of this water, A. D. 1755, and obtained the same proportion of solid Contents, and which exhibited the like appearances as above; particularly they flamed on the red hot iron, the flame being white, and blue at the edges, and emitted a strong smell.

It is a comparatively pure and simple Chalybeate, of a good degree of strength, and in defect of the *German Spaw* might be easily sent to *Dublin* and sold there, if well bottled and kept cool, and drank the same day it should be taken up, or even the second day after.

It has not been yet so much used as it deserves, but has been experienced to be exhilarating in lowness of Spirits and Vapors, particularly such as proceeded from indigestion, perhaps the most ordinary cause thereof: and I was informed of a woman troubled with a Spitting of blood, who coming to the spot, and drinking it in small quantities for several months, beginning with four ounces, and increasing to half a pint or more, was cured.

Compare the Accounts given above of the water near *Athlone*.

S E C T. XIX.

KANTURK Water

IT is situate about nine miles from *Mallow* in the Co. of *Cork*, at a place called *Corra*, about half a mile Smith's N. W. from the town of *Kanturk*, on the banks of nat. and civil Hist. the river *Alla*, which in great floods overflows it. of the county of Cork.

On the opposite bank of the river is a thin Iron-vein covered with a dirty brown Ochre.

The water is of a disagreeable, nauseous smell and taste.

It tinged Silver immersed in it a quarter of an hour at the fountain, of a copper-colour; but this did not appear in what was transmitted to *Dublin*, where, however, the solution of Silver added to the water gave a white cloud tending to yellowish; a confirmation of the presence of some Sulphur.

Otherwise it appears to be a comparatively pure Chalybeate; for tho' Oil of Vitriol made some little ebullition with it, indicating that it is not without a mixture of calcarious Earth, yet this appears to be but small; for Oil of Tartar gave no cloud with it, and it lathered smooth with Soap.

Galls at the fountain struck it of a deep crimson inclining to purple; but they had no such effect on what was transmitted to *Dublin*, in bottles well corked and waxed, where it was examined eighteen days after being taken up, when it had deposited some Ochreous sediment, it was not fetid, but of a weak ferruginous taste, rough, bitterish, and in some bottles subacid. It had blackened the Corks.

The Analysis.

I. *Spontaneous.* The Ochreous sediment spontaneously deposited, was a little attracted by the Magnet,
even

even before calcination, but strongly, and even at some distance after calcination, and became red.

2. *Artificial*. A gallon exhaled left about five grains of sediment of a brown yellowish colour, somewhat viscid, of a somewhat brackish taste, fetid, inflammable on the red hot iron, and when calcined was attracted strongly by the Magnet.

Corol. It is a Chalybeate of considerable strength at the fountain, and the appearances exhibited both by the water and by its sediment on evaporation, concur in shewing some admixture of Sulphur.

Its general Operation is quick by urine: some it purges, and to a few taken in large quantities it proves emetic.

It is said to blacken the stools of those who drink it.

It is of repute in lost Appetite, Pain and Inflammation of the Stomach, in the Piles, in the Gravel, in Hysteric, Scorbutic and Scrophulous disorders, Consumptions and Barreness: and two instances are given of Dropsies considerably advanced, cured by drinking of it.

S E C T. XXI.

L A R G Y Water,

FROM a well on the lands of *Largy*, half a mile S. of *Agbalun*, (see Sect. 6 of Class I.) in the barony of *Mugherestapbenagh* and county of *Fermanagh*, about a quarter of a mile E. from the road from *Lisnaskea* to *Agbalun*.

N. B. It lies within five feet of a small meandering brook, with the water of which it is sometimes mixt, as it was at the time of trying it on the spot, by *James Leonard*, July 13, 1745, in good weather; and therefore the water unmixt is stronger than it wou'd appear to be by the following trials, viz.

Powder

Powder of Galls turned it on the spot of a beautiful light reddish colour. Examined in *Dublin* six weeks after, it stunk a little, and had the flavour proper to Sulphureous waters, viz. like boiled eggs, was clear, turned of a very faint reddish with Galls, and exhibited a mixture of red and blue with Logwood.

The Analysis.

BESIDES the fœtor it acquires by keeping, it also stinks a little on the spot when the current is obstructed; and moreover the Mud at the bottom of the well is very black, and of a strong smell, and is used by the name of *Mire-black*, in dying wool black, (an argument of Iron, if not of a native Vitriol) and is preferred to Copperas, as being less acid and corrosive.

Corol. It is a Chalybeate of considerable strength at the fountain, and has a mixture of Sulphur; and tho' little known in medicine, wou'd undoubtedly, on proper trials, manifest virtues more considerable, than many, which by chance have acquired a greater reputation.

S E C T. XXII.

DRUMCROOE Water

FROM a pump belonging to Counsellor *John Balfour*, on the land of *Drumcrooe*, near *Maguire's bridge*, in the barony of *Magherestapbenagh*, and county of *Fermanagh*.

It is a hard water; for Soap was long before it formed a lather with it; but milk was not curdled by it.

At the fountain, *July 13, 1745*, the powder of Galls turned it of a deep purple.

It was bottled in good weather and sent to *Dublin*, by my faithful correspondent above mentioned *James Leonard*,

Leonard, and on opening six weeks after being filled, it was very fetid and had the flavour proper to sulphureous waters, viz. like boiled eggs, tho' it did not tinge Silver as those waters, either on the spot, or at the distance above mentioned.

It had blackned it's cork when opened as above in *Dublin*, and turned red with Galls, but the colour soon faded, as did also the blue it struck with Logwood.

A mechanical use of it worth noting, tho' common to it and other Chalybeate waters, is, that by adding Galls to it, and boiling wool in it, a good standing purple-colour is produced, for which purpose it is commonly used, and moreover it dyes the best of blacks.

Corol. It is a Chalybeate of considerable strength at the fountain, and has probably some small mixture of sulphur.

As to it's medicinal qualities, thus much has appeared from casual experiments.

The servants of the gentleman aforesaid, made flummery of this water, but it so purged them for twenty-four hours, that they would make no further use of it.

This accidental effect does not however seem to have proceeded from such a Salt as ordinarily gives waters a purging quality; for most of these curdle milk, which this water did not.

Dr. *Mc Hagh* of *Inniskillen*, sent a gentlewoman to this pump, whose face was greatly swelled and covered with Pustules; on drinking the water for a fortnight, the old skin flaked off, and she acquired a new face.

S E C T. XXIII.

KNOCKDRIMAGH or GARROWHILL Water.

IT enjoys a southern aspect at the bottom of *Mount Leinster* in the county of *Carlow*.

It

It was examined on the spot, and in *Dublin* in the years 1734, and 1740.

At the fountain it emitted from the mouth of the bottle, a strong or somewhat sulphureous smell, and was of a rough and bitterish taste, which it retained strongly next morning, having been bottled the night before.

Having been a fortnight bottled, it stunk much, and had deposited a considerable quantity of Ochre, and regained the Chalybeate taste.

Besides the smell, the result of the following experiments indicates some mixture of Sulphur, *viz.* Silver kept immersed twenty-four and thirty-six hours in the well, suffered no change; but a Shilling put into the red sludge that runs from the well, and kept there three or four days became much the colour of a counterfeit guinea which had some of the Gold worn off.

This water, tho' it seems to be a comparatively pure Chalybeate, by it's lathering with Soap and exhibiting a small precipitation with Oil of Tartar, yet by the appearances it exhibited at the fountain with the two volatile Alcalies, seemed to betray something vitriolic more than most of our common Chalybeates, *viz.* Spirit of *Sal Ammoniac* turned it of a straw-colour, with a greenish circle at the surface of the mixture, and Spirit of Hartshorn had the same effect.

This greenness gives me suspicion of some subtle Vitriol, tho' less than in several of those of the first Class which become green also with the fixed as well as volatile Alcalies.

Oil of Vitriol excited some very minute ebullition.

Milk boiled with this water suffered no coagulation, tho' *Saliva* mixed with it curdled a little, and so did *Albumen Ovi*, and withal turned red.

It blackned the stools of one, or of several that drank it, whereas *Ballyspellan* water had not that effect.

Syrup of Violets turned it a little greenish.

Galls

Galls at the fountain gave it a deep purple almost black, and Logwood a deep blue; and both these articles continued to tinge it nearly to the same degree when it had been kept in a bottle corked twenty-four hours; but in seventy-two hours, the power of tinging with Galls was lost.

The putrid water above mentioned kept a fortnight, which had regained it's Chalybeate taste, regained also the power of striking a deep purple with Galls, which it retained when made blood-warm, but lost it soon after.

The Analysis.

It throws up a bluish scum.

A gallon exhaled by a very slow fire, gave thirteen grains of a brown pale snuff-coloured sediment, which was of a brackish and somewhat bitterish taste, sparkled greatly on the red hot iron, and stunk, fermented with Spirit of Vitriol, grew moist on being exposed only one night to the air, and calcined an hour, was strongly attracted by the magnet.

Corol. It is a strong Chalybeate at the fountain, and comparatively pure, but seems to contain also a pitance of marine Salt and Vitriol, with a little Sulphur.

It has been drank in loss of Appetite, and pains of the Stomach.

An abstemious young man, who in a leprous like disorder, or rather an *Impetigo*, had undergone a Salivation and drank the decoction of Guaiacum with good effect, tho' not an absolute cure, in the wet summer of 1750, drank these waters liberally for the space of seven weeks; during this course, fresh pustules appeared all over his body, which, otherwise than those he had before, (*viz.* which were watry) came to a maturation.

His diet being too low, *viz.* chiefly milk and whey, the last week of the course he was seized with an unusual pain in the region of the stomach and breast, evidently

evidently flatulent, with a vertigo and great faintness, owing undoubtedly to an indiscreet and immoderate use of the water with too low a diet; for upon his returning to the use of his decoction of Guaiacum, and taking a bitter Chalybeate wine, those complaints vanished.

A middle aged man fell into a loss of appetite and digestion, being heavy and flatulent after eating, and withal had lost the floridness of his complexion: the secretions were very irregular, he sweated too much, made little urine and was costive; in short, he seemed to have an incipient obstruction of the liver and kidneys.

He drank daily three or four quarts of this water for three months, joining the use of Steel, Gum-Pills, Bitters, and the *Lixivium Saponariorum*, and recovered both his complexion and health compleatly.

A third patient aged forty-three, fell into divers nervous complaints, viz. dejection of spirits, terrors, and palpitation of the Heart, together with an obscure fever, the consequence of an imperfectly cured Ague and irregular Gout. He soon recovered on the use of these waters assisted by *Hiera picra*, the Gum pills, tincture of Steel and *Elixir Vitrioli*.

S E C T. XXIV.*FRANKFOORD Water,*

SITUATED near *Frankfoord*, two miles W. from *Ballyboy* in the *King's County*, is esteemed a good Chalybeate, and was recommended as such by Dr. *Delamere*.

Of two specimens sent to *Dublin*, the one taken up *May 27*, in a rainy season, the other *July 1*, in good weather, the first examined five, the second seven days after it had been taken up, the first had lost it's Chalybeate taste; the second retained it with a roughness, and did not stink; both emitted plenty of elastic matter.

It

It seemed to have no great mixture of foreign contents with the ferruginous; for it soon lathered with Soap, tho' it exhibited some white sediment with the Alkalies, and it made no ebullition with Oil of Vitriol.

The solution of Silver in one specimen turned it blackish, and exhibited a small precipitation; in another a subtle yellowish cloud, probable indications of Sulphur.

It turned of a bright green with Syrup of Violets.

That which had been taken up five days, and in the rainy season did not strike purple at all with Galls; but that which had been taken up seven days and in good weather, gave a pale purple with Galls, and a deep blue with Logwood; but both these tinctures faded in a few hours; (otherwise than happens in the waters of the first Class) and moreover, the mixture with Galls left a blue circle at the surface, which descended deeper after two or three days standing, and became greenish, an argument of Nitre.

The Analysis.

1. *Spontaneous.* The sediment spontaneously deposited sparkled much on the red hot iron, and being calcined, turned red and was attracted by the magnet.

2. *Artificial.* A gallon yielded twenty three grains of brown *Residuum*, which was of a brackish taste, fermented with Vinegar, turned green with Syrup of Violets on standing, sparkled on the red hot iron, and was in some small parts attracted by the magnet.

The Salt separated from the other parts grew moist in the air, like an Extract.

The indissoluble matter separated from the saline and dried, flamed on the red hot iron.

Corol. It is a pretty strong Chalybeate, at least at the fountain, and the ferruginous parts are combined with a little marine Salt and Nitre, and probably a little Sulphur.

S E C T. XXV.

' *BALLYNASTOE Water.*

THERE is one, or rather two springs of this sort near *Ballynastoe* in the county of *Wicklow*, which to omit an account of were an unpardonable neglect, both on the account of their being some of the strongest of this Class, and of their situation so near the Metropolis, that with proper care, the water might be conveyed to *Dublin* in the cool of the morning, with very little injury to it's original qualities, and in defect of the *German Spaw water*, prove a good *succedaneum* for it.

This water did not only retain the ferruginous taste, and smell strongly, when it had been twelve hours bottled, but even three days in another trial, tho' much weaker than at the fountain.

The following experiments shew the comparative purity of this water, or that it has but little heterogeneous mixture with the ferruginous parts, *viz.*

Soap lathered smooth, forming no curds with it; it continued clear with Oil of Tartar and solution of Alum: the solution of Silver exhibited only a subtile, whitish cloud, and solution of Sugar of Lead a small white cloud; to these add that Oil of Vitriol and Spirit of Salt made no ebullition with it.

Nevertheless, Silver immersed all night in the fountain was tinged of a light yellow and redish colour. Hence however it appears to be not without some mixture of Sulphur.

Galls gave a violet-purple to a specimen of the water which had been taken up six hours, and a deep purple to it when it had been taken up fifty-hours; but only a beer-colour tending to purplish when taken up three days; and when kept four days in a bottle well corked, it gave no tincture to Galls.

It received a deep purple from green Tea, which

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however

however soon faded; and the tincture it received from Galls was lost on being exposed in a glass seven days.

That which had been taken up six hours, when made blood-warm, continued to strike a deep purple with Galls, tho' it ceased to do this when made scalding hot.

Hence this water bears heat better than that of *Dunnard* did; and by all experiments it appears to be one of the strongest of this second Class, tho' weaker, or far less retentive of it's original qualities than the waters of the first Class.

I kept one bottle of it three years, and then opening it, found it had but little fetor, and presently struck a purple tincture with Galls.

The Analysis.

A GALLON of it yielded from eight to twelve grains of a snuff-coloured sediment, which was of a brackish taste, yielded to the magnet without previous calcination, sparkled on the red hot iron, scarce fermented with Oil of Vitriol; rubbed with *Sal Ammoniac* smelt pungent.

Corol. It is an excellent and strong Chalybeate, both at the fountain, and with proper care, a day or two after it has been taken up: it is also comparatively pure, tho' not without Sulphur at the fountain head, and probably has a pittance of *Natron*.

I am informed, that being taken near the fountain, it has been found to agree and pass well where the *Pymont* water did not.

N. B. About three miles from this is another well, situated at a place called the *Lake*, in the middle of a mountainous bog, the water of which being procured by the industry of my friend, *John Rose* Apothecary in *Dublin*, appeared in all respects to resemble the foregoing, save that it was considerably stronger, retaining

retaining its faculty of tinging with Galls longer, and keeping the tincture given longer, tho' not so long as the waters of the first Class.

The sediment spontaneously deposited by the last named water in one experiment sparked greatly on the red hot iron, and in another it flamed and smelt strong.

The difficulty of access to this water renders it less applicable to use, however in the summer of the year 1751, tho' a cold and wet one, a Gentleman repairing to the neighbourhood, experienced the good effects of it, viz. being thirty-five years old, he had suffered considerably under the reliques of an Ague, had taken much of the *Cortex*, but still had aguish symptoms, together with an inflation at the stomach, and pains in the feet, with pustules on the legs; he drank this water for seven weeks, sometimes in bed, and sometimes interposed the use of *Sal polychrest*, and became free from all complaints. It did not purge him, tho' it had this effect upon another at the beginning.

At the same time a child of seven years old drank it with success in an Erruption on the skin, of what sort I did not learn.

S E C T. XXVI.

BALLYMASCANLAN Water.

IT was formerly in great repute, and frequented many years, tho' lately, as I was informed, *A. D.* 1751 lost (*a*); however, as the following observations concur with those on the other Chalybeates last described, in enlarging and illustrating the history of the Chalybeate waters of this country, I shall here subjoin them as part of the set of experiments made in consort on these waters.

It was situated in a rocky mountainous country, between *Cooly* and *Dundalk*, about three miles from the

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(*a*) But it is said to have been opened again, *A. D.* 1755.

last named place, and about a mile *North* from the village of *Ballymascanlan* in the county of *Louth*.

This water transmitted to *Dublin* in bottles well corked and waxed, at two different times, after having been taken up about ten days, was clear, of a strong ferruginous taste, and fetid.

That it was a comparatively pure Chalybeate appeared from its lathering smooth, and forming no curds with Soap, and only a cloud in the middle, and a small ochreous subsidence with Oil of Tartar, and a minute precipitation with solution of Silver.

Nevertheless, that it was not wholly void of Sulphur at some times, appeared from hence, that Silver immersed in a specimen of it taken up in *August*, acquired a somewhat dusky or leaden hue, which however did not happen in another specimen of it taken up in *October*.

It struck a deep purple with Galls at the fountain, as did also that which had been taken up ten days, which had also greatly blackned it's cork, gave a deep blue with Logwood, which continued above thirty-six hours.

The Analysis.

1. *Natural*. The stones over which it run, were of a deep yellow and red colour.

2. *Artificial*. A gallon yielded by exhalation eight grains of a dark-brown, almost black *residuum*, which was of a brackish taste, and moistened in the air, and was in some small parts of it attracted by the magnet, even before calcination, but upon calcination it became reddish, and was strongly attracted.

It sparkled on the red hot iron, but made no ebullition with Oil of Vitriol, nor Spirit of Salt.

Corol. It is a comparatively pure Chalybeate, and of considerable strength at and near the fountain, and has also a pittance of marine Salt and Sulphur.

S E C T.

S E C T. XXVII.

TRALEE Water.

It's situation is delightful and commodious for air and exercise, at a place called the *Forts*, on the strand by the sea, two small miles from *Tralee*, the principal town of the county of *Kerry*, in a gravelly soil, and on the East-side somewhat inclining to turf.

The well is near a foot deep, and near a yard over; it rises out of a tussock of yellow clay mixed with gravel.

It has been known these fifty years this year 1752, and is now in great repute, by reason of divers notable cures lately effected by the use of it.

This water is remarkable for having not only the ferruginous and rough taste common to other Chalybeates, but upon repeated observations on specimens of it transmitted to *Dublin*, where it was examined after it had been a month or six weeks bottled, it acquires also the smell and the flavour of boiled eggs proper to the sulphureous waters, and exhibits plenty of bubbles on the sides of the glass, both probably the effect of putrefaction, the sulphureous smell being not observable at the fountain.

The result of the experiments made on the water examined in *Dublin* at the distance of time above mentioned, concurred also in exhibiting the appearances proper to the sulphureous waters, viz.

Silver kept immersed in this water became copper-coloured, and in another experiment fusc like lead, and bluish, and copper-coloured, and the solution of Silver exhibited a white yellowish cloud, and a grumous white sediment, in another trial a brown precipitation.

Gold immersed in it, grew of a deeper yellow, and Copper became redder.

The solution of *Englisch* Vitriol exhibited a deep clear, tending to blue; solution of Sugar of Lead gave

a reddish tincture, and a small brown sediment, which is much the same appearance as the sulphureous water of *Swadlingbar* gives.

The water loses the sulphureous smell when the bottle is left half empty a day, and when it is evaporated to the consumption of half, it loses both the sulphureous smell and chalybeate taste.

Scholium. The above experiments and observations shew a Sulphur combined with the iron, tho' latent at the fountain; for the water at the fountain has none of the above mentioned effects on Silver immersed, nor does it affect the smell, as when transported as above in bottles.

I have met with some other instances of the same thing in other waters, both of the Chalybeate kind, and some plain waters, particularly in those of *Cape-clear*, and *St. Bartholomew* near *Cork*, and in the late *Glassenbury* water from *England*; all which, tho' sweet at their respective fountains, gave the same tokens of a Sulphur extricated by Putrefaction, as the *Tralee* water does, and so did the Chalybeate of *Dunse* in *Scotland*, tho' it is not common to meet with this in other Chalybeate waters become putrid.

Besides Iron and Sulphur, the *Tralee* water is not much loaded with other minerals, for tho' Oil of *Vitriol* and Spirit of Salt caused a considerable ebullition with it, Soap lathered smooth, and the fixed and volatile Alkalies exhibited only a little whiteness, and solution of Alum caused no considerable precipitation, and the Hydrometre stood in it at the same height as in distilled water, and at the same height as in rain-water in *C. Smith's* experiment.

Syrup of Violets tinged it green, but when the water had been left open in a bottle two nights, the blue colour was retained; to this agreed the appearances with others of the tincturing articles, particularly *Rhubarb*, which gave it only an amber colour, *Ashbark* a pale blue circle, and *Brazil* a pale red, from whence

whence we may conclude, that this water is not impregnated with an alkaline Salt as the *Pouhon* and *Geronssterre* waters in *Germany*.

Galls at the fountain gave a deep purple-colour, as they did also to the water in the putrid state above mentioned; and *C. Smith* observed it to strike a fine claret-colour in the town of *Trálee*, after it had been taken up some days, and a blue tincture with Logwood, tho' this soon faded to an olive and purple; and a bottle left open here all night, would not any longer tinge with Galls in one experiment, tho' it did in another; so that it is a pretty strong Chalybeate, or a Chalybeate of a middle degree of strength.

The Analysis.

1. *Spontaneous.* The water from some of the bottles sent to *Dublin*, turned wheyish with a bluish cast.

The well at the bottom has a blackish fat sludge.

The channel is deeply tinged with a yellow ochreous matter.

The foam is of a bluish white colour, with me white and orange-coloured.

The Ochre spontaneously deposited being calcined, reddens and flies to the Magnet.

2. *Artificial.* During the evaporation, a small quantity of a saline whitish matter is thrown on the sides of the pan. A gallon exhaled left in one experiment nineteen grains, in another twenty, and in *Charles Smith's* experiment made near *Trálee*, thirty-six grains of sediment, of a pale-brown ochre-colour in one experiment, in another of a dark brown colour, and of a brackish taste; it fermented with Spirit of Vitriol; it excited no smell when rubbed with *Sal Ammoniac*; it burnt black on the red hot iron.

The Salt separated from the indissoluble parts was yellowish, and by it's saline taste, by it's melting in the air; by it's emitting an acid fume in plenty when rubbed with Oil of Vitriol, and by it's solution pre-

cipitating a gross white curd with solution of Silver, gave ample evidences of its being marine Salt.

The indissoluble part separated from the saline (of which it seemed to be near the one half in weight) was raggy, such as I have observed to be the texture of the *residua* of several of our Bog-waters, and of a dark brown colour, and flamed on the red hot iron. In one Specimen it made no ebullition with Oil of Vitriol nor Spirit of Salt, tho' it did with both in another, as tho' some calcarious matter were present in it at one time, and not at another.

Corol. It is a light Chalybeate, and comparatively pure, and contains a latent Sulphur extricated by putrefaction, as appears by the phenomena exhibited by the water at a distance from the fountain, common to Sulphureous waters. The greater quantity of Sulphur in this than most other plain Chalybeates will give it a preference to many of them, inasmuch as a more abundant, tho' latent Sulphur, being the proper *Menstruum* for Iron, will by a more intimate dissolution of the Iron render it more active in operation; besides that the Sulphur being exalted by the force of the circulation in the human body, will also be more active. It is far less volatile than the Sulphur in the *German Geronsterre* water. Its Salt is marine, but scarce considerable enough to deduce any notable effects from, except perhaps that it may give it some degree of an attenuating quality, and by this means render it more effectual in removing Viscidities.

I proceed next to give some account of the sensible effects and Virtues of this Water, which I owe chiefly to Dr. *William Collis*, a physician in the neighbourhood.

An Earth-worm put into this water soon dies.

When it is taken in smaller quantities, as from three pints to two quarts, it is diuretic; an enlargement of the dose makes it gently purgative, and when further increased, it becomes emetic and cathartic: but its chief

chief operation is by urine, of which an accidental instance occurred in a Race-horse, which the groom happened to water at this well, who fell into so plentiful a profusion of urine, that the owner thought he had got the *Diabetes*, and was so reduced, that he was incapable of running his match, but soon after recovered.

It raises the Spirits to a great degree, and gives a voracious Appetite and good Digestion: *Charles Smith*, in his natural and civil History of the county of *Kerry*, observes it to sit well on the stomachs of the drinkers, many of whom take to the number of a dozen half-pint glasses, and yet, except where the Stomach and *primæ viæ* are evidently foul, it hath scarce ever been known to vomit.

It began to be much used in the year 1746, which was owing to *John Blennerhasset*, Esq; who, the preceding spring had entirely lost his Appetite, was restless and much disordered, whom Dr. *Collis* advised to drink this water; and after a little preparation and regular drinking, in a short time he recovered his appetite and rest, and became much healthier than for many years past.

This roused the indolent inhabitants of *Tralee*, and induced several persons long afflicted with hysteric Cholics, Rheumatisms, the Scurvy, and several other chronic diseases, to use the waters; and indeed most of them received singular benefit thereby.

In a letter written A. D. 1742, the aforesaid Dr. *Collis* gave the following account of it:

“ As far as I have tried it, I think it very prevalent in all inveterate obstructions, especially those of the Liver, whereof an instance occurred in my neighbourhood, viz. a Taylor had for several years laboured under a Scirrhus tumor of his Liver, which raised up his ribs like those of a Rickety child on the right side: he became consumptive, and on application to me, I prescribed a gentle purgative Diet-drink of
deobstruent

deobstruent herbs, which he used in the spring, and in the summer following I advised the use of the water."

"He took it in large quantities for two days, and it purged and vomited him: on the third day, not thinking the water strong enough, he took the scum of the well and broke it small, and mixed it with the water and drank plentifully of it, which vomited him severely; and after he had gone to some distance from the well, finding himself much easier, he returned and repeated the dose, which had the same effect: on his return home, its operation, both by Stool and Urine, was violent, so that when he came home, he was excessively weak and faint, but found himself free from all his disorders, and by my advice he continued the use of the water, drinking a pint of it every morning for a month, which thoroughly restored him; and tho' I did not think he could have out-lived next autumn, he is at this day perfectly healthy (a)."

"It had the same effect upon several others who were deemed incurable, particularly Mr. M-- --, who was perfectly

(a) This account of the Cure of an obstructed Liver by violent Purging upwards and downwards, is corroborated by the following Observation of *Prosp. Ælpinus de Medicina Ægyptiorum*, cited by *Rieger* under the article *Æs*, viz. "Plures inveniuntur qui Æris insusum sumpserunt ut ab antiquis Hepatis Lienisq; obstructionibus sanarentur, quibus per vomitum & alvum facta copiosiori evacuatione pristinae sanitati restituti fuerint, qui nunquam potuerunt aliis usi medicamentis leviter purgantibus sanari."

These Evacuations however, do not appear essential to the cure of at least recent obstructions of these *Viscera*, since by the accounts above given of several other Chalybeates, particularly our *Kilronan* and *Atblone*, as well as the *German Spa* waters, this is effected by them as an Alterative; and inasmuch as not only comparative anatomy in Fowl, shews that the Meseraic veins receive the fluid contents of the Guts, and convey them directly to the Liver, but even in the human body this is reckoned also partly to be the road of the finer parts of the Chyle, and other fluid contents of the Guts, it is highly probable that some parts of the mineral waters go directly to the Liver.

perfectly cured of a decay by constant vomiting from an obstruction in his Liver. He drank near a quart of it every day for a month, and took a small quantity of Salts which made it mildly purgative."

Listrim, Jan. 29, 1742.

Again, the same Physician, A. D. 1745, gives the following concurring account.

"As for our *Tralee* Spaw, I can assure you, that by several experiments tried this year, it had wonderful effects in a disorder which happened more frequently this and last year than ever I knew it, *viz.* a swelling in the Stomach and obstruction in the Liver, and a great disposition to a Dropsy. In this disorder the water succeeded to my wish, and compleated several cures, particularly one on a man of seventy years of age." And *Charles Smith* observes, that the man who took care of the well was cured of a dropsy and Jaundice by it.

And in a Letter dated *October 25, 1746*, are the two following Observations:

"A Lady, since she lay in last winter, having a Scirrhus tumor on one side of her belly, had advice from several Physicians both of *Cork* and this country, and took vast quantities of antihysterical and deobstruent medicines, which not having the desired effect, she tried the efficacy of our Spaw, which in a month or six weeks time has removed all her disorders."

"A poor woman having a Scirrhus swelling in her Spleen, which affected her so that she could neither labour, nor lye in bed, I advised her, *præmissis universalibus*, to use the water, and after a few days she could walk to the well (above a mile) and in a few weeks was perfectly recovered."

Some instances also have been given me of Dropsies considerably advanced, cured by drinking this water, in some of which it proved purgative; and tho' I cannot procure

procure the particular Histories, and the above given are less compleat than could be wished, yet to suppress them, such as they are, I apprehend would be injurious to a History of this water, and thro' a false modesty declining to offer such hints as the sagacious Physician will know how to improve in the cure of these rebellious disorders, for which he frequently dismisses his patients to foreign waters, neglecting those at home, which would prove equally or more effectual, and with far less inconvenience and expence to his patients.

Next, the two following Histories, from the above named Physician, seem to render it credible that these waters might have good effects in lacerations, or even Ulcerations of the urinary passages, viz,

“ A Child aged eight years, had been troubled with a pissing of blood for two years. Having often examined his urine and found therein several large grains of Sand, I concluded that the erosion of his tender vessels by them must have been the occasion of his disorder, and having ordered him two doses of Manna, I advised the use of this water, by carrying him thither every day on horseback ; and after the use of it about twenty-one days his disorder is quite vanished, and he has continued above two months perfectly sound.” And in either this or another instance of a *Mictus sanguineus*, which returned on a fright, it was cured a second time by the use of the same water.

“ A Child about six years old had exquisite torment when he made water : upon examination of the Urine I found a large quantity of digested Pus in it : I advised the use of this water : the first six or seven days he continued in pain, but afterwards a daily amendment was perceived, and in about three weeks he could make water without a wry face, and only a few corrupted strings appeared in his urine. The foolish father could not be prevailed on to continue him here the whole season, neither did I hear what happened to him since, being at fourteen miles distance.”

The

The same Physician furnished me with the following histories of its remarkable good effects in several Tabid cases, also under his own observation, wherein it was given in small quantities so as to make it not purgative.

“ A young Widow, aged about thirty, fell into a deep decay, had a most violent Cough, Hectic fever, and spit purulent matter, attended with hoarseness, night-sweats, and all the symptoms of a confirmed *Phtisis pulmonalis*. She was prevailed on by me to ride to the well, it being a pleasant ride of about two *English* miles. She took about a pint of the water every morning: in about three weeks she found a sensible amendment, her strength daily encreased, her night-sweats abated, and in about six weeks she was perfectly restored: however she continued the use of the water the whole season, and since is become perfectly healthy. The water had no visible effect either by urine or stool, but in my opinion, by its deterring, healing and strengthening quality, effected the cure.”

“ A Nephew of mine, from an ill-cured or neglected Pleurisy, fell into an *Empyema*. The *Horror febrilis*, and constant Hectic Fever, with the usual symptoms, soon convinced me that the Imposthume was formed: a constant pain in one certain place directed the application of outward medicines, and a protuberance on the intercostal Muscles pointed out the place for the manual Operation, for which every thing was prepared: but the obstinate mother would not yield to have it performed. The Boy languished for some days, and at last the Imposthume, thro’ the absorbent vessels, or some other great benefit of Nature, broke thro’ the Lungs into the *Bronchia*, and he discharged by degrees a vast quantity of thin, purulent, fetid, sanious matter. I still plied him with vulnerary, balsamic, and gently healing medicines; and when I found the matter inclining to a laudable Pus, I gave him the *Tralee* water milk warm, about
half

procure the particular Histories, and the above given are less compleat than could be wished, yet to suppress them, such as they are, I apprehend would be injurious to a History of this water, and thro' a false modesty declining to offer such hints as the sagacious Physician will know how to improve in the cure of these rebellious disorders, for which he frequently dismisses his patients to foreign waters, neglecting those at home, which would prove equally or more effectual, and with far less inconvenience and expence to his patients.

Next, the two following Histories, from the above named Physician, seem to render it credible that these waters might have good effects in lacerations, or even Ulcerations of the urinary passages, viz,

“ A Child aged eight years, had been troubled with a pissing of blood for two years. Having often examined his urine and found therein several large grains of Sand; I concluded that the erosion of his tender vessels by them must have been the occasion of his disorder, and having ordered him two doses of Manna, I advised the use of this water, by carrying him thither every day on horseback; and after the use of it about twenty-one days his disorder is quite vanished, and he has continued above two months perfectly sound.” And in either this or another instance of a *Mictus sanguineus*, which returned on a fright, it was cured a second time by the use of the same water.

“ A Child about six years old had exquisite torment when he made water: upon examination of the Urine I found a large quantity of digested Pus in it: I advised the use of this water: the first six or seven days he continued in pain, but afterwards a daily amendment was perceived, and in about three weeks he could make water without a wry face, and only a few corrupted strings appeared in his urine. The foolish father could not be prevailed on to continue him here the whole season, neither did I hear what happened to him since, being at fourteen miles distance.”

The

The same Physician furnished me with the following histories of its remarkable good effects in several Tabid cases, also under his own observation, wherein it was given in small quantities so as to make it not purgative.

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half

half a pint at first, and by degrees increased the dose, at length caused him to ride on horseback to the well, being half a mile distant. His strength returned slowly, but in process of time he perfectly recovered."

He adds yet another instance, well worthy of attention, shewing its good effects beyond all expectation in a case of this sort, *viz.*

"*Philip Grady*, a linen-weaver, who had for several years laboured under a tertian Ague, in spring last was seized with a Pleurisy, from which he with great difficulty recovered: afterwards he applied to me, having all the symptoms of a man in the last stage of a Consumption. I ordered him stomachicks and other medicines with the use of these waters, which he took regularly, and is now miraculously free from all his disorders."

Lisfrim, Oct. 25, 1746.

I shall conclude with one instance more of the efficacy of these waters in a case also almost deplorable, and by no means giving way to pharmaceutic remedies, *viz.*

A Gentleman, aged forty-five, was entirely cachectic, and short-breathed, and over-run with Scrophulous ulcers, attended with an ichorous discharge, and carious Bones in several places, and in consequence hereof, lost one of the joints of his fingers.

Divers mercurial and other medicines were regularly prescribed for a considerable space of time, and among the rest, a Chalybeate wine had been of some service to him, but the Ulcers still continued rebellious, together with colic pains, and a total loss of appetite and flesh.

In this state in the summer 1746, he was advised by Dr. Barry to drink these waters, which he did with amazing success; his sores digested and dried up, and his appetite, flesh and strength returned. They purged him in the beginning, and afterwards

improved

proved strongly diuretic. He continued to drink the waters till the summer 1748, when he was in a good state of health. He drank them also in winters when he observed them to be as strong, or rather stronger than in summer.

N. B. Thus the *Tralee* water has been honoured with a more copious account of notable Cures effected by it than almost any other Chalybeate in the foregoing or subsequent parts of this work; but it is necessary to remark, that this seems to have been meerly accidental; viz. from its falling under the notice of a more diligent, and perhaps better qualified Observer of its effects, than has been the luck of many other waters of the same kind, and by all experiments impregnated with the same general principles, which have either not been used at all, or at random rather than by regular prescription, nor under the notice of any proper Observer; so that we are not to imagine the powerful effects above related in those obstinate disorders of Obstructions of the Liver, Dropsies, Consumptions, and Ulcers of the Kidneys, to be peculiar to the *Tralee* water, but rather common to divers other Chalybeates, many of which have here and there, upon divers casual trials, proved not less efficacious in these disorders, as appears in their histories in divers places of this and my larger Work; and it is not to be doubted, but many others, which, by reason of their situation, or other unfavourable circumstances, have not been used at all, might, in good hands, be capable of furnishing as great a number of instances of their happy effects.

S E C T. XXVIII.

DINGLE Water.

I Hope my reader will excuse my annexing this water to that of *Tralee*, on the account of it's situation, in the neighbourhood in the same county, being about a mile to the N. E. of *Dingle*, on the lands of *Ballybeg*, tho' for want of more experiments, I am as yet unable to determine whether in regard to the retaining its qualities at a distance it do not rather belong to the first Class, it being undoubtedly a Chalybeate of great strength, as appears from the following account of it, which was given me by Dr. *Jeremy Leyne*, a Physician in the neighbourhood.

" It's smell and colour is like that of common spring-water; it's taste ferruginous and afterwards somewhat vitriolic.

The Spirits of Hartshorn and *Sal Ammoniac* gave it a yellowish or light citrine appearance; Oil of Tartar *per deliquium* turn'd it milky.

Fresh milk boiled with equal parts of it is not curdled.

Silver kept immersed in it twenty-four hours acquires a rusty brownish colour, which washes off very easily.

Fresh powder of Galls tinges it of a purple colour; more Galls added, gave it somewhat of a bluish cast.

The Analysis.

A GALLON of it exhaled to a dryness in an earthen glazed vessel, gave twenty-four grains of a dark brown sediment, of a lixivial taste, which diluted again with a little water, gave a very slight tincture with fresh powder of Galls.

In operation it proves Emetic to some, to others Cathartic, to others greatly Diuretic.

A Gentlewoman labouring under obstructions of the
uterus,

uterus, found benefit by taking it at my perswasion last summer, and is determined to resume the use of it this season." *Dingle May 23, 1752.*

Corol. It is a Chalybeo-Sulphureous water, and on the spot appears to be more richly impregnated with both those minerals than the *tralee* water, which last however being softer is more tolerable to some stomachs than this.

S E C T. XXIX.*HODDER'S FIELD Water.*

FROM *Hodder's field*, formerly called *Ringabroe*, situated on the West-side of *Cork-harbour*, and about eight miles S. E. from *Cork*, was sent me by Dr. *Tucky*, a water supplied by a small, but perennial spring, which I purposely annex here, on account of the strength of its Chalybeate impregnation, joined probably to a pittance of Sulphur, tho' not strong enough evidently to betray the Sulphur by the smell on the spot.

Two bottles filled *October 26, 1753.* arrived in *Dublin* the 4th of *January* following, when the water had by putrefaction acquired in one bottle a smell partly musty, and somewhat of an Egg-like flavour in the other bottle, the smell was highly fetid, like a stinking gutter. The taste also was musty and ferruginous, and it had blacken'd the Corks deeply.

Galls gave it in this state a claret-colour, which it kept unchanged a week. Logwood at the fountain tinged it blue.

Silver, Gold, and Copper immersed in it in this state suffered no change of colour, tho' at the fountain it is said to discolour Silver, and (*viz*, in the putrid state above mentioned) the solution of Silver gave it first a brown amberish colour, which afterwards became purplish, with a white reddish grumous sediment; and

the solution of Sugar of Lead gave a small slight yellow sediment, and the solution of Copperas a yellowish grumosity.

It formed a lather with Soap, but with difficulty.

The Analysis.

It throws down an ochreous sediment; its mud was neither black nor fetid, but of a pale light colour, however, it sparkled and smelt strong and somewhat acid on the red hot iron, reddened on calcination, and was then attracted a little by the Magnet.

Three pints and half exhaled to dryness gave six grains, being nearly the proportion of sixteen grains to a gallon, of an ochre-coloured matter, of a somewhat high flavour; it sparkled a little on the red hot iron, and was a little attracted by the Magnet without calcination; it fermented with acids, and being rubbed with *Sal Ammoniac* smell'd pungent.

Corol. It is a strong Chalybeate water on the spot, and probably has a pittance of Sulphur and *Natron*, and as such is worthy of notice, and drank at the fountain, or near it, might undoubtedly be applied to many good purposes, altho' it has not been taken notice of above a year before the above experiments were made on it, nor as yet been medicinally used.

FELL'S Well

IS an eminent Chalybeate in the barony of *Iraghticonner* in the county of *Kerry*, which at the fountain is said to sparkle like the *German Spaw*, and has been drank with good effect in divers chronical diseases, particularly in scorbutic cases.

Smith's
nat. and
civil Hist.
of the
county of
Kerry.

A specimen of it carefully bottled and pitched in dry weather the beginning of *November 1752*, was opened in *Dublin, December 2.* following, when it had a strong ferruginous flavour, and was sweet, tho' part of the Ochre was precipitated, and the Corks were much

much blacken'd: in this state Galls gave it a deep purple, as they did also to some of the same water in a bottle left loosely corked two days; Logwood gave it a blue tincture, and these tinctures from the Galls and Logwood abode lively (nay that from the Logwood was more deep) at the end of seven days than at first, a probable indication of an intimate solution as well as strength of the mineral.

That it is a light water and very sparingly impregnated with any other mineral but iron, appears from the following observations:

The Hydrometre in a frosty day stood at the same height in it as in distilled water, viz. at 4. 0.

Soap quickly lathered smooth with it: Syrup of Violets gave it no tincture; Spirit of Vitriol excited no ebullition with it, and Silver acquired no change of colour by being immersed in it, tho' the solution of Silver turned it partly pearl-coloured with a yellowish cloud.

The Analysis.

A GALLON exhaled, during evaporation exhibited no calcarious matter on the sides of the pan, and left only the small quantity of eleven grains of an ochre-coloured sediment, which was attracted a little, even in this crude state, by the Magnet, was of a taste somewhat brackish, fermented both with the Spirit and Oil of Vitriol, and emitted an acid vapor with the last, and a somewhat pungent smell when rubbed with *Sal Ammoniac*.

Corol. It is one of the lightest and purest Chalybeates, of considerable strength, bears carriage, and has probably a pittance of *Natron* combined with its Iron.

S E C T. XXX.

A Water near FIVE-MILE BRIDGE

ON the land of *Ballynphelick*, midway between *Cork* and *King'sale*, described in *Smith's* natural and civil History of the county of *Cork*, with regard to the impregnating minerals, claims a place here.

About two hundred yards above the spring, they have sunk a shaft for Coal, encouraged by an external appearance of a black Coal slate, some of which Slate contains a *Marcasite*, which being burnt, betrays Sulphur and Iron.

The water had a strong taste of iron at the fountain head, where it struck a dark purple with astringents, even when examined in the evening; but it is said to be much stronger before Sun-rising.

Being sent to *Dublin*, where it arrived in about a fortnight, it had still the ferruginous taste, and was also fetid and struck a pink colour with Galls, and moreover tinged Silver kept immersed in it forty-eight hours, of a leaden and copper-coloured hue, an evidence of Sulphur combined with the iron.

It is little known in practice, but not unworthy the attention at least of physicians in the neighbourhood.

S E C T. XXXI.

A Water on the Mountains of MOURNE.

AT *Ballyuran* on the South-side of the mountains of *Mourne*, about seven miles from *Ross-trevor*, and five from *Rathfryland* in the county of *Downe*, is a well yielding a large flow of water, which is drank by many poor country people in summer.

A specimen of two bottles of it taken up *July 17, 1752*, arrived, and was examined in *Dublin, July 28*, when it was of a strong ferruginous flavour, but fetid withal, and gave a dilute claret-colour with Galls, which

which abode several days, a bright blue with Logwood, which continued lively three days, but on the 4th day faded.

It had also blacken'd the Cork, and the Sycomore bowl into which it was poured; it turned greenish with Syrup of Violets; with the solution of Potashes, it exhibited only a very subtile cloud, and a subtile ochreous subsidence.

Silver immersed in it became a little dark-coloured.

The Analysis.

It throws up a white bluish scum.

The proportion of a gallon exhaled to a dryness gave nine grains of a white and ochreous *residuum*, of a pungent and bitterish taste, and which grew damp in the air, fermented and emitted an acid fume with Oil of Vitriol,

Carol. It is a comparatively pure Chalybeate, and of a considerable degree of strength, not without a pittance of Sulphur and marine Salt.

S E C T. XXXII.

A Water at CORLURGEN near BAILLYBOROUGH.

IT is situated about a mile from *Baillyborough* in the county of *Cavan*, and in the neighbourhood of the famous *Lough Lbrighs*.

It is of a ferruginous taste.

It is a soft water, lathering instantly with Soap; it is also light, for the Hydrometre stood in it at 6. o. when in a neighbouring soft spring it stood at 6 $\frac{1}{2}$.

Syrup of Violets turned greenish on standing with it all night.

A few drops of the solution of Silver put into a glass of it, first exhibited a purple cloud at the top, and a whitishness below, and in a small space of time, the

whole became of a high beer-colour ; but the same quantity of that solution put to the same quantity of the water, which had been exposed in a glass three hours, exhibited a much fainter colour, and the sediment deposited in this latter mixture, was of a much paler red, than that with the water fresh taken up.

Oil of Vitriol made a minute ebullition with it, and much more than with the neighbouring soft spring.

Galls tinged it at the fountain of a dilute claret-colour, which on standing, became of a deep sanders red.

Exposed three hours in an open glass, it still retained both its chalybeate taste, and tinged with Galls almost, if not quite, as deep as before ; and in a phial filled with it corked and rozined, the water poured out at the same hour next morning, both tasted well of the mineral, and tinged with Galls almost as deep as at the fountain ; but when it had been kept forty-eight hours, it lost most of its taste, and of its property of tinging with Galls, as it also did when made scalding hot.

The Analysis.

A GALLON of it yielded about twelve grains of *residuum*, which was of a brackish taste, and fermented a little with Oil of Vitriol.

Corol. It is a comparatively pure Chalybeate, and of a considerable strength, and, by the experiment with Oil of Vitriol, appears to be more powerfully antacid than the water of the neighbouring soft spring : and the experiments with Galls shew that it may be of use, not only at the fountain, but to those who live in the neighbourhood, if well bottled and corked ; nevertheless, it appears from the experiment with the solution of Silver, that whatever those parts are that form the mentioned tincture, whether Sulphur or Nitre, are in a great measure lost on the water's being exposed

exposed for a short space of time, so that to obtain the water in its absolute perfection, it is the surest way to drink it at the fountain.

In July 1739, at seven in the morning, four persons drank of it on the spot to the quantity of four pints, and four pints and half each: it pass'd quickly by urine with most of them, and to three of them gave from four to five and six stools.

SECT. XXXIII.

KILMEADEN Water.

THE well, tho' small, yields plenty of water, and lies in the county of *Waterford*, and barony of *Middlebird*, in the parish of *Kilmeaden*, a quarter of a mile from the village of *Kilmeaden*, four miles and a quarter from *Waterford*.

It was much prescribed about the year 1714, and with good success, but laid aside since, like some other modes, without sufficient reason, it being a Chalybeate not of the weakest class, as will appear by the following examination of it.

Charles Smith, Author of the *natural and civil History* of the county of *Waterford*, published under the sanction of the *Physico-historical Society* in *Dublin*, assured me, that besides the strong ferruginous taste, it had an obscure acidity and briskness somewhat like a weak solution of the *Lapis Hibernicus*; and others observe it to have an agreeable briskness after being one day bottled, and to make excellent punch, an effect common and well known also of the waters of *Spa* and *Pymont*, and owing to a fermentation excited by the acid of the fruit, with the absorbent Earth and Iron in the water.

In bottles well corked it retained the ferruginous taste, tho' less strong, forty-eight hours after they had been filled,

It appears to be a comparatively pure Chalybeate ; for Oil of Tartar and Spirit of *Sul* Ammoniac continued clear with it.

Galls at the fountain turned it of a foxy brown inclining to a copper-colour, and they had the same effect on the water kept forty-eight hours ; but when it had been kept three days, the Galls had no effect : yet at some times the water appears to be stronger : for four bottles having been filled in the morning, *September* 3. 1744. and corked and waxed with great care, were sent to *Dublin*, where they were not opened until eight days after, when the water still retained the ferruginous taste and was sweet, and struck a pink-colour with Galls, and a blue with Logwood, which last tincture however faded in six hours : and moreover, after I had left one of these bottles out of which I had taken a fourth part, slightly corked forty-eight hours, it had not even then quite lost the ferruginous taste, and it still struck a faint purple with Galls, a sure evidence of considerable strength.

The Analysis.

I had a singular opportunity of observing distinctly the two different mineral matters impregnating this water, by keeping some bottles of it six years and a half ; on opening of which I observed a fair and beautiful separation of an *Ochry* and *Sparry* matter, the last was semipellucid, but both this and the *Ochry* matter fermented strongly with Spirit of Vitriol : A gallon yielded of all together eighteen grains : the *Ochry* matter sparkled strongly on the red hot iron, the *Sparry* but little (*a*).

It

(*a*) So much more effectual is the slow Process of Nature in separating these minerals than our violent and rapid chymical processes by fire, which either hurry off, or blend and confound the parts : the like slow Process of Nature, I have elsewhere noted to exhibit a much more just Analysis than the Fire, in the Book of the Petrifying Springs.

It is a good Chalybeate, not only drank at the fountain, but may well supply *Waterford* and many other neighbouring places.

Its Operation is mostly Diuretic :

It sits light, and has been found to pass swiftly.

S E C T. XXXIV.

DUNNARD Water.

BEFORE the present prevailing fashion of drinking the *German Spaw*, this water used to be brought to *Dublin*, and sold at *Stephen's green*, as appears by an inscription in wood over the well ; and indeed with proper care, it might be preserved for one or two days with little loss of its original qualities, which it retains much longer than the waters of the third Class, such as *Islington*, *Templeoge*, &c.

The well is situated in a large romantic Glyn, a mile from the town of *Dunnard*, and eighteen miles from *Dublin*.

The water is of a ferruginous taste, with a bitterness in the throat ; and on rain succeeding great drought, I observed it to be sensibly stronger, and to smell somewhat sulphureous.

It retained the taste when kept cool above twenty hours, tho' strongest at the fountain.

The following experiments shew that it is a comparatively pure Chalybeate, or that it has very little mixture of calcarious Earth or Salt, *viz.*

It lathered with Soap without previous curds : Oil of Tartar gave no cloud, but turned it yellowish, as did also Spirit of *Sil Ammoniac*, from a beginning precipitation of the Ochre : these experiments were made at the fountain. The solution of Sugar of Lead gave a very subtle whitish cloud : the solution of Silver turned it of a pearl-colour, which afterwards became reddish, and then of a muddy brown ; and
in

in one experiment on standing all night a very small, whitish, grumous subsidence appeared.

The Acids caused no ebullition with it, excepting a very minute one from Oil of Vitriol.

Milk boiled with it is not coagulated; and Milk is found to agree well with a course of this water: *Albumen Ovi* however was slightly coagulated by it, and fasting Spittle exhibited some cloud tending to coagulation.

Syrup of Violets turned it of a light green, especially at the fountain.

This water, added to the tincture of *Lignum nephriticum* at the fountain, deprived it of the blue tincture, and turned it of the colour of white wine, whereas the same water, added to the same tincture when brought eighteen miles from the well, deepened the blue colour; a probable indication that at the fountain head there is a subtile acid, which is lost or enveloped upon carriage to any distance, for which reason undoubtedly, the water is in its utmost perfection at the fountain.

N. B. This Experiment is perfectly analogous to those made by Dr. Charles Lucas, with other Tincturing articles on the varieties of Chalybeate waters he examined with great accuracy at and near *Spa*, where he constantly found that the Syrup of Violets, juice of *Cyanus*, and the blue Paper, manifested the subtile Acid contained in those waters at the fountain, by the red and crimson colours imparted to them, which property they soon lost on being exposed to the air, or otherwise, deprived of their volatile parts, turning the Syrup green, &c. a strong confirmation both of the presence of a volatile Acid at the fountain, and of the importance of drinking it there, in order to obtain the Virtues of these waters in the utmost perfection.

Galls

Galls at the fountain strike it of a deep purple, and Logwood of a blue : before sun-rising it gives a deeper tincture, and on rain after drought the Galls tinged it almost black ; when well corked, it has been observed to colour well with Galls two days ; but kept four days it did no longer strike purple with Galls.

A small degree of Heat deprives it of this property of tinging with Galls ; for it lost it entirely when made blood-warm ; and that a very moderate Heat in a great measure destroys this quality appears from the following experiment : I kept a flask of it in my Bed-chamber at *Dunnard* all night, *September 5. 1740.* and it next morning drew only an amber-colour with Galls ; whereas, when it was exposed all night to the cold air in the grass, it next morning retained the ferruginous taste, and continued to strike purple with Galls. Hence Gentlemen, who sometimes send for it from distant parts, as *Kildare, &c.* always order it to be carried in the night, and pack'd with grass to keep it cool, finding by experience, that by this means it retains its original qualities entire.

Nor does it bear being exposed to the Air, but soon suffers thereby a separation of its parts ; for when I had exposed it in an open glass from seven to eleven in the morning, it had thrown up a thin scum, nor would it any longer strike purple, but only a dun amber with Galls, such as our *Lucan* water did, when the same proportion of Galls was used.

I kept some bottles of this water above four years, when I found that they had recovered their ferruginous taste, and the water sparkled (a) in the glass and struck purple with Galls as at first, but was somewhat fetid,
having

(a) Dr. *Lucas*, in his *Essay on Waters*, remarks of the waters of this Class in general, that they suffer just what fermented liquors do by bottling, viz. become more acid and brisk, and instances in the *Chevron* water near *Spa*, which had been four years bottled, that upon the first opening, it was brisk, smart and sparkling.

having by putrefaction generated fresh air, and reabsorbed its precipitated Ochre.

Green Tea gave the water a violet purple; and on boyling, when the chalybeate taste is gone, it draws from the Tea an exceeding pleasant infusion.

The Analysis.

1. *Natural.* It throws up a variegated, blue, red, white and green Scum, and precipitates an Ochre resembling the brown Ochre of the shops, which is somewhat unctuous, and of a brackish taste; it sparkled much on the red hot iron, and was then manifestly attracted by the Magnet.

2. *Artificial.* A gallon exhaled by a slow heat gave but a little more than three grains of sediment, which was brown, ochreous, and a little saline.

Corol. It is a comparatively pure Chalybeate, tho' probably not without a pittance of marine Salt: and tho' it be not one of the strongest waters of this Class, it however bears carriage much better than any of the third Class.

Its operation is chiefly by urine, more rarely by sweat, sometimes by stool.

A pint only has, at the beginning, or to the unaccustomed, caused giddiness and sleepiness: and two frolicksome young men drank each thirty-six pints of this water, and were intoxicated to an extreme degree, even as from a large dose of spirituous liquors, so that they could neither sit, stand, nor walk.

It has been successful in restoring lost Appetite, and in the cure of the Gravel and Scurvy.

It has been observed to make the lean fat, and the fat lean.

A Clergyman in the neighbourhood used every winter to be troubled with a Hoarseness disabling him from preaching, but was cured by drinking this water, which was attended with an unusual breaking out on his leg.

A young

A young man troubled with flying Heats, and divers other symptoms of the Scurvy and Hypochondriacal disease, and who grew worse on the use of the hot antiscorbuticks and spirituous liquors, was greatly relieved by drinking two quarts of this water in a day for the space of six or seven weeks.

It was also of great use to another in an Hypochondriacal case, attended with inappetency, watching and discomposure of Spirits.

A man of a gross and scorbutic habit, aged thirty-eight, having been two years before grievously Asthmatic, even to an *Orthopnoea*, with oedematous tumors in the legs, was temporarily relieved by bleeding, an emetic, some purges and bitters; but still continued to be short-breath'd upon any brisk exercise, and had a Cough every morning and after dinner, and flushings in his cheeks after dinner, and was subject to a heat in the palms of his hands. He was also habitually thirsty, especially in the morning.

He drank the waters of *Wexford* for three summers with very good effect, *viz.* the recovery of his breath, and the pustules he had on his skin (which came out more plentifully the first year) vanished, his exorbitant bulk was reduced, his appetite voracious, and his thirst much abated, tho' not absolutely taken away, so that it seemed requisite that he should still repeat the same course another season; and *Dunnard* waters being situated nearer him, I sent him thither: he found these more Diuretic than the *Wexford*, though both these waters passed also with him by Sweat.

He continued the use of *Dunnard* waters six weeks, with a sensible confirmation of the Cure, though not an absolute completion of it, being otherwise irregular.

Appendix.

A. D. 1752, This inestimable spring is lost thro' the avarice of some persons lately digging for Copermine in its neighbourhood (a).

S E C T. XXXV.

JOHNSTOWN Spaw.

A Patient of mine in the neighbourhood, of whom in the sequel, greatly distressed for want of the *Dunnard* water, used another situated in a Glyn at a place called *Johnstown*, five miles E. from *Dunnard*, and two miles S. from *Ballymore-Eustace*, which, even in the rainy season of *June 1752*, manifested at the fountain (and an hour, and six hours after being taken up when it arrived in *Dublin*) a high ferruginous flavour, and appears to be a water, like that of *Kilmasheoge*, and some others in the county of *Dublin* impregnated with an intimately dissolved iron: for whereas, both when taken up an hour, and six hours after, it struck a dilute claret-colour with Galls, this tincture continued (otherwise than in *Templeoge* water) several hours, and was not lost in many days, and so is a more durable, tho' less deep tincture and more slowly struck than several others.

A gallon of it yielded about 4 or 5 grains of sediment

(a) A. D. 1753. *September 22.* near the town of *Dunnard*, and a mile from the old Spaw, was discovered a spring issuing out of the side of a Hill, said to be replete with iron ore, which at the source is of a strong Chalybeate taste, and strikes a deep violet colour with Tea. It arrived in *Dublin* twenty-four hours after being filled, when it had blacken'd its Cork, but lost all chalybeate taste, and did no longer tinge with Galls. This also, like the old Spaw, exhibits but a very small quantity of contents upon evaporation; for I obtained scarce half a grain of a light brown matter from a pint and eleven ounces of the water, which matter however was attracted a little by the Magnet, even in its crude state, and sparkled and flamed on the red hot iron.

ment partly white, and partly ochre-coloured, which fled to the Magnet, and smell'd pungent when rubbed with *Sal Ammoniac*, and sparkled and smell'd strong on the red hot iron.

A maiden aged about thirty, after an ill cured ague and grief, fell into Inappetence and indigestion with alternities of either vomiting or pain of the stomach, with great flatulence, a costive belly, and black stools like soot; she had taken the bitter wine and tincture with little effect; then (having formerly drank *Dunard* water with good effect) was by me dismissed to this spring, that failing, and having premised and sometimes interposed the use of a mild purge of the tincture of Rhubarb and Sena, she drank the water three weeks, gradually advancing to four pints in a day; the first fortnight, there was an efflorescence on her skin, in an unusual manner, of red itching pimples; she soon recovered her appetite and digestion, the pain of the stomach vanished, and cheerfulness returned, which was remarkably greater, when she took the water at the fountain, than when brought to her two miles from it; she recovered more completely on the use of the *Garrowhill* Spaw in the county of *Carlow* afterwards.

S E C T. XXXVI.

WEXFORD Water

HAS been in great reputation as a Chalybeate for many years past.

The spring is situated at the west end of the town, on a rising dry ground, and open to the eastern sun, and there belongs to it, and lies just behind it, an Enclosure of a sufficient extent, adorned with gravel walks, penthouses, seats, a lofty spacious dining room and other proper conveniencies.

Here

Here are good lodgings, and a market well stored with all sorts of provisions.

This water is of a ferruginous taste and smell, and when fresh, is of a sprightly, agreeable stypticity, nearly resembling that of a solution of a grain of *Sal martis* in two ounces of water; but when it has been long out of the spring, it becomes of a disagreeable vappid bitterness.

The ferruginous parts in this water, do not appear to be much loaded with heterogenous mixtures; for the Hydrometre stood in it at the same heighth as in distilled water, Soap soon lathered with it, and Oil of Tartar, and Spirit of *Sal Ammoniac* were either quite clear with it, or turned a little yellow, from a beginning precipitation of the Ochre; nevertheless, the following experiments shew, that it is not wholly void of Earth and Salt, viz. the solution of Silver exhibited a white grumous precipitation, and the solution of Sugar of Lead had a like effect, and Oil of Vitriol produced a small ebullition; Spirit of Salt rendered it more transparent, and exhibited many bubbles, especially in the fresh water, and so did *spiritus nitri dulcis*, but Vinegar none.

Syrup of Violets retained the blue colour a good while, but turned greenish in forty-eight hours.

Galls at the fountain, and in the morning, strike it of a deep purple, but in that which had been kept twenty-four hours in an uncorked bottle, a bright purple only; and it loses this property of tinging with Galls, together with its ferruginous taste, when kept four days.

It draws a grateful tincture from green Tea, in common with several of the purer Chalybeates.

The Analysis.

1. *Spontaneous.* The ochre-coloured matter it deposits, is of a pale-brown colour, and insipid: it sparkled on the red hot iron.

A little

A little Spirit of Salt added to this matter turned it yellow, and when this mixture was diluted with a large quantity of distilled water, and powder of Galls was added to it, a blue colour appeared, a *phenomenon* which also occurred on the same mixtures with the scum of our *Templeoge* water, a probable indication of an *Acidum vagum* in the bowels of the Earth united to the ferruginous matter, inasmuch as the lost vitriolic quality or property of tinging with Galls, is here restored by the addition of an Acid.

The same ochry matter turned almost as red as *Minium* by calcination, and was then attracted by the Magnet.

Dr. *Sweetman* observes, that the Scum which is of a blue reddish colour, taken off and dried, is easily inflammable, and emits vapours nearly resembling those of common Sulphur. See the
chap. on
Templeoge
water.

2. *Artificial.* A Gallon of it yielded by exhalation nineteen grains of sediment, of the colour of dark brown Ochre, of a brackish and obscurely bitterish taste; it stunk on the red hot iron, and in some experiments sparkled thereon; it fermented much and emitted a fume with Oil of Vitriol; it fermented also a little with Vinegar; it soon grew damp in the air, and being kept many years in a corked phial was partly melted, and turned green with Syrup of Violets.

Corol. It is a Chalybeate of considerable strength, especially at or near the fountain, has more of an absorbent Earth united to its Ochre than *Dunnard*, *Drumkit*, and several other Chalybeates; and from the evidence of the above experiments, and others on the Salt separated from the Earth, this appears to be chiefly marine.

This water, in common with many other Chalybeates, has been observed, at the first use, to cause Giddiness.

Some of the foregoing experiments, I owe to the correspondence of *Peter Sweetman*, Physician at *Wexford*,

ford, to whom also the publick is indebted for the following observations.

“ It would be endless to enumerate all the disorders in which these salutary waters are drank; the Chlorosis, obstructed and immoderate Menstrua, bilious and nervous Colicks, the *Gonorrhœa simplex*, *Fluor albus*, Barrenness, Jaundice, Cachexy, the Hypochondriac disease, Gravel, loss of Appetite and Scurvy, are (a) diseases mostly relieved, and often cured by the long protracted use of these waters.”

“ In fine, wherever the intentions of cure are, to brace gently the relaxed solids, to correct a muriatic, putrid or bilious acrimony, or open by a safe aperitive, without commotion, obstructions formed by inspissated fluids, or caused by the spasmodic strictures of the capillary vessels, these waters will be found eminently serviceable.”

“ I could produce many instances of their good effects, but that I think such proofs unnecessary to you, who can easily conceive what changes the contents of these waters can make on the human body, when they are attenuated, and divided so minutely, and so intimately mixed with a fluid, (*viz.* water) capable of pervading the most remote meandres of the capillary vessels.”

“ I would not have any one imagine, I think this remedy alone sufficient to extirpate all these Evils: on the contrary, I judge it absolutely necessary to joyn other helps, and call in the exactest regimen and most efficacious medicines, in order to the most speedy and effectual cure, by the united force of all.”

“ It was a popular prejudice here of long standing, that

(a) To those diseases may be added from Dr. Comerford, who published an account of these waters, A. D. 1687, Ulcers of the Kidneys and Bladder, Vomiting, the Dysentery, the Cæliac passion from an obstruction of the mesenteric veins, the Rheumatism, Headach, Vertigo, Asthma, Palpitation of the Heart, and the Itch.

that Milk was not to be taken during the use of these waters, but back'd by the authority of *Hoffman*, my own reason, and some previous experiments, I ventured to drink them with a third part or half milk mixed, and this with good success in an inveterate, troublesome Cough, which frequently afflicted me very severely. I continued them in this manner the whole season, and they were so far from exasperating my Cough upon taking, as the naked water would have done, that I every day perceived a sensible correction of the acrimony, which was the immediate cause of my complaint: an additional strength and vigour with an unusual increase of flesh, convinced me more and more of their great efficacy."

"In order to refute the vulgar error of this water's coagulating Milk, I mixed three fourths of milk just milked with one fourth of water: the mixture was as fluid at the end of forty-eight hours as the moment the milk and water were mixed, whilst the milk alone acquired the thickness of that coagulated by Rennet."

S E C T. XXXVI.

CAPPA RD Water

SITUATED on the mountains of *Slieve bloom*, about a mile from *Rosenallis* in the *Queen's County*, seems to deserve a place among the waters of this Class, *Dr. Martin* of *Mountmelick*, having assured me, that it retained its power of tinging with Galls many hours, altho', when it had been taken up five days, when it was examined in *Dublin*, it had precipitated its Ochre, and lost the mineral taste, and had only that of pure water.

It appears to be otherwise a comparatively pure Chalybeate; for it was almost clear with Oil of Tartar; it lathered smooth with Soap after curdling a little,

gave a small cloud with solution of Sugar of Lead, and a subtile small cloud with solution of Silver.

The Analysis.

A GALLON yielded about eight grains of a dark coloured sediment, of a brackish taste, which fermented with Vinegar, and some small parts of it (when calcined) fled to the Magnet.

It restored a person greatly reduced in flesh and strength by an inveterate Ague, to whom I recommended it in my travels.

S E C T. XXXVII.

TOOMAVARA Water

SITUATED a mile East from *Toomavara* in the county of *Tipperary*, on the great road between *Dublin* and *Limerick*, has recommended itself by its good effects observed for these ten or twelve years past.

A specimen of the water filled *July 26*, was examined in *Dublin*, *August 7*, 1754, when it was of a musty, fetid, ferruginous flavour and taste, shewing it had undergone a degree of putrefaction: in this state it struck a dilute claret-colour with Galls, the tincture abiding four days, and the Cork that had stopp'd the bottle was very black, so that it appears to be a Chalybeate of considerable strength.

It is otherwise a comparatively pure water; for Soap soon lathered with it, and the solution of Sugar of Lead exhibited only a subtile wheyishness, tho' the solution of Silver turned it white, and then exhibited a purple cloud and dark-coloured sediment.

Corol. It is a Chalybeate of a considerable degree of strength at the fountain, and seems to have some pittance of Sulphur combined with the ferruginous principle.

This water is a powerful Diuretic, and commonly makes the drinker light, active and sprightly.

A young

A young Woman troubled with a great Indigestion, being never able to eat or drink any thing without a subsequent uneasiness and sickness, was entirely cured by drinking this water twenty days; and tho' the disorder returned in eight or nine months, she was again restored by drinking it only a few days the next season.

It is not only esteemed in loss of Appetite, but also in Scorbutic sores, both internally and externally used; and some inveterate Ulcers of the legs, are said to have been expeditiously healed by it.

S E C T. XXXVIII.

The GROVE Water.

IN the same county, at a place called *The Grove*, about two small miles S. W. from *Burroughs O Kane*, is another Chalybeate water which has been used medicinally since the year 1751.

A specimen of it transmitted to *Dublin*, and examined, as the former, about twelve days after its being filled, was fetid, and of a musty, ferruginous taste.

It had blackened the Cork, and Galls struck it of a weak pink-colour, nor did the tincture abide, as in the Water of the preceding Section, but was soon precipitated in grumes of the same colour, and a wheyish-coloured cloud appeared, and on its standing four days with the Galls, a greenness extended itself to above half the depth of the glass, to which add, that it curdled with Soap, and grew milky with the solution of Sugar of Lead, so that it is a less pure Chalybeate than the foregoing, having a mixture of calcarious Nitre:

However it is recommended in the like Cases as the former, and particularly has been successful in the cure of scorbutic Ulcers in the face.

O F T H E

CHALYBEATE WATERS.

C L A S S I I I.

THE third Distinction I make of Chalybeate waters, is of such as, tho' they strike as deep, and sometimes a deeper tincture, and more quickly with Galls than those of the first and second Class, yet do not retain this quality of tinging with Galls at a distance from their fountains; and moreover, the tincture received from the Galls is very soon lost, and even much sooner than in the waters of the first and second Class, tho' it is observable that these waters, as well as those, recover their taste and property of tinging with Galls upon putrefaction.

Hence these waters are of use, or at least are in any tolerable degree of perfection, only on the spot; nor do they bear carriage to any advantage, unless preserved by art: nevertheless, even these waters drank at the fountain have also recommended themselves by their good effects, and in some delicate habits may be justly preferred to those that are stronger, tho' many of these also appear to be of very considerable strength at their fountains, both by the tincture with Galls and by the taste.

The waters of *Forges* in *Normandy*, and ours at *Ballyspellan* are notable instances, among many others, of the Virtues and powerful effects of this Class of the light and weak Chalybeate waters: and tho' it is observable of several, if not most of these, that they do not tinge the stools black, as the stronger Chalybeates do, this may be no objection to their efficacy, but rather

ther the contrary; for as this blackness consists in some degree of a precipitation of the ferruginous matter in the water, these lighter waters suffering no such precipitation of their parts, may be supposed to get admittance in their entire, native, attenuated state, into the blood: and they are particularly recommended in hypochondriacal and nervous cases.

Qu. Is the singularity above-mentioned of these waters owing to a more volatile Gas, or to a less intimate mixture or dissolution of the mineral matter, and upon that account subsiding sooner, or to both? Their striking the tinctures more quickly with Galls agrees either to a less quantity of the dissolving Acid, or to a greater degree of its volatility, than in those that strike the tinctures more slowly, as in those of the preceding Class, and in either supposition the ochreous particles are left to attract each other, and make a quicker subsidence.

S E C T. I.

H O L Y W O O D Water

IS situated on the mountains of *Holywood* in the county of *Dublin*, or on the glyn of *Knockbrag*, on the estate of Lord *Molesworth*.

Near it is a rotten Slate, Iron-stones, and several rich ferruginous Ochres, and vast quantities of ochreous Sludge almost choaking up the current, the spring being entirely neglected, altho' worthy of better care, being, if taken fresh at the fountain, the strongest Chalybeate in the county.

It is of a taste strongly ferruginous, like unto Smith's forge-water.

It at some times has given tokens of Sulphur; for in *July 1748*, a Silver six-pence put into a flask of it on the spot, and brought to *Dublin*, being taken out next morning, was of a dark blue, and pale copper-

colour ; but this experiment was repeated without success, in *August 1749*.

Galls at the fountain turned it instantly of a deep violet-purple, which colour however soon fades, as in *Issington* water, so that it does not retain the tincture received near so long as divers Chalybeates which strike much weaker tinctures with Galls, *v. g.* the *Kilmasheoge* water, which, tho' it strike a far weaker tincture, yet keeps it much longer than this, and moreover retains the faculty of tinging with Galls longer ; for in one experiment, *Holywood* water brought to *Dublin* did next morning only strike a pink-colour with Galls ; in another trial it had entirely lost the power of tinging with Galls in about eighteen hours, as likewise the ferruginous taste.

I observed it to curdle with Soap one summer, but to lather smooth with it in a trial made on it the next summer, which I judged to proceed from the greater strength of the vitriolic acid at one time than another.

I observed some roots of the *Pentaphyllum palustre* (an astringent) growing in the neighbouring Sludge, to be turned black and shining, a proof of a vitriolic juice, and at the same time an illustration of the manner by which Oaks buried in bogs become also black.

The Analysis.

1. *Natural.* The Scum is deeply variegated with red, blue, green and white.

The Ochre-coloured matter spontaneously deposited, being dried, flamed on the red hot iron.

2. *Artificial.* A gallon exhaled left of *Residuum* from seventeen to twenty-one grains, which seemed to be chiefly a pure Ochre, exhibiting very little whiteness on the sides of the pan during evaporation. It was of the colour of brown Ochre, of a bitter and brackish taste, with an empyreumatic flavour. It fermented with Spirit of Vitriol, and yielded considerably to the Magnet without previous calcination.

It

It moistened in the air, sparkled and smell'd strong on the red hot iron, and being rubbed with *Sal Ammoniac*, smell'd pungent and fetid.

Corol. It is richly impregnated with ferruginous matter, and withal probably some *Natron*, and at some times a little Sulphur; but he that wou'd have it in its native perfection, must drink it at the fountain, where I doubt not but it wou'd sufficiently recommend it self by its good effects, if properly used.

S E C T. II.

A Water near GRANGE MORE.

THIS water, tho' little known, and of difficult access, I judged to deserve a place here, as by reason of the affinity of its appearances to those of the foregoing, and some of the following waters, it may help to illustrate the history of Chalybeate waters in general, as well as shew what it possesses peculiar to such, whose situation near it, may render it of use to them.

The well, which is very deep, and lies to the N.E. of *Kinnegad* in the county of *Westmeath*, about seven miles N. E. from *Kill-lucan*, and three miles E. from *Grange-more*, in a park adjoining to the E. of a great red bog, near three miles long, boyls out of the earth with great force, and a large strong stream.

The water is limpid, tho' the ochreous matter in the channel (which is of a brown reddish colour) gives it a reddish cast, as do also the bog-holes and drains near it to the water; from whence it has been romantically described to me as being of the colour of red ink, but when transported to *Dublin*, it had the bluish cast proper to sulphureous waters.

The neighbouring soyl is barren, being tinged with the ochreous matter above mentioned, and is covered with a short kind of grass, but very few herbs.

The

The Cattle that are fed here, and have no other water to drink, but what is in some degree impregnated with the mineral, are scoured by it; and it is said that it changes their Hairs grey (a).

The water on the spot, is described by my messenger, (a person conversant in these matters) to be of a brassy kind of smell, and an extremely harsh and rough ferruginous taste; however, it retains this taste, but a very little while; for in two samples sent to *Dublin*, in *July* and *August* 1751. in bottles carefully corked and sealed, one of which, was opened thirty-two, and the other forty-four hours after being filled, it had scarce any ferruginous taste at all, and the Corks in one of the parcels, were not tinged at all, in another, but very obscurely; (so fugitive is the *Gas* or subtile acid impregnating these waters;) to which is perfectly agreeable the success of the experiments with Galls at the fountain, and at a distance from it, *viz.* the powder of Galls at the fountain changed the water in less than half a minute's time, of a deep claret-colour, but in the two parcels, one of which had been taken up thirty-two, and the other forty-four hours, the same powder gave to one no tincture at all, and to the other, only a weak pink-colour, which was soon precipitated in grumes, leaving the upper part colourless, save that on standing all night, it exhibited a green circle at the surface.

Syrup of Violets on the spot turned it green; it had the same effect in *Dublin*, and on standing a few hours, it became very green, one argument of *Natron* corroborated by the experiments following on the *residuum*.

It excited a minute ebullition with Spirit of Vitriol.

It

(a) I recommend this to further observation, not daring to vouch for the truth of it, tho' it is no more than what *Pliny* lib. 2. cap. 103. affirms of the river *Clitumnus* in *Faliscum*, that it makes the Oxen that drink it white, and that the river *Melas* in *Bætiæ* makes their Sheep black.

It curdled considerably with Soap, both at the fountain, and in *Dublin*.

The solution of Silver turned it at the fountain of a deep dark red colour with a sediment: in *Dublin*, it turned first bluish, then purplish, and precipitated a dark coloured grume, a collateral evidence of Sulphur.

The Analysis.

1. *Natural.* The reddish brown ochreous matter, brought from the neighbourhood of the well, was in some parts attracted by the Magnet without previous calcination; but when roasted in the crucible, it fled in great quantities to the Magnet, so that here is a rich ferruginous Ochre sufficient to impregnate the water, even as in the neighbourhood of *Holywood* water which seems much to resemble this.

Six pints of the water precipitated spontaneously near two grains of a brown ochre-coloured matter, which in some small parts yielded to the Magnet without previous calcination, sparkled and emitted a white flame on the red hot iron, and smell'd like burnt turf.

2. *Artificial.* A gallon exhaled left about sixteen grains of a pale-brown matter, of a brackish taste, which also yielded in some parts to the Magnet without previous calcination, sparkled and smelt strong on the red hot iron; it soon turned green, and in three hours of a bright green with Syrup of Violets, and smell'd pungent and urinous, when rubbed with *Sal Ammoniac*, and somewhat fetid on being rubbed with Salt of Tartar, and did not readily moisten in the air.

Corol. It is a very strong Chalybeate at the fountain, where alone, or near it, it can be drank in perfection; besides iron, it has a mixture of *Natron*, and some sulphureous matter.

As to its operation and virtues, we have little account from experience, save that being drank at the fountain it has purged, not only cattle, but men, an
effect

effect common to this and many other Chalybeates, especially at the first use of them; and were it easier of access, I doubt not but it might have recommended itself as much, or more than *Islington*, and many others of this Class as an alterative.

S E C T. III.

A Water near BALLYNASTOE.

BESIDES the two waters already described under the second Class near *Ballynastoe* in the county of *Wicklow*, there is a third near the same place, plainly belonging to this Class, and of a distinct kind from the two others, both as bearing carriage far less than either of them, and differing from them in taste and operation.

It springs thro' a crevice between two great rocks, and dribbles down to the ground on the S. W. side of a great mountain of difficult ascent.

On the spot, it has an extremely strong, harsh, ferruginous and nauseous taste, so far as to incline one to vomit after taking a mouthful of it; but after it had been bottled twenty-one hours, it lost the ferruginous taste entirely.

It was also difficult to make it lather with Soap on the spot, tho' when transported to *Dublin* (a distance of about fourteen miles) it lathered instantly, the Acid being lost in the latter case.

It formed some bubbles on the sides of the glass into which it was poured.

Galls on the spot turned it instantly of a dark purple-colour, but when bottled twenty-one hours, and in another specimen about forty-eight hours, it exhibited little or no tincture from Galls, tho' the Cork was tinged, and there was some ochry subsidence.

The

The Analysis.

A Gallon exhale left of a brown, ochre-coloured sediment, (and during evaporation, the sides of the pan were whitish) of an obscurely brackish taste, eight grains, which being rubbed with Syrup of Violets, became of a bright green colour in four hours, and rubbed with *Sal Ammoniac*, smelt strongly pungent, and fetid, and a little pungent when rubbed with Salt of Tartar: it was in some small parts attracted by the Magnet without previous calcination: it sparkled and smell'd strong on the red hot Iron.

Corol. It is a strong Chalybeate at the fountain, and the ferruginous parts are combined with a little *Natron*.

Eight labourers drank of it in summer, 1751, on the spot, some to a pint, others less; it first swelled their stomachs, then purged them upwards and downwards.

Scholium. On comparing the three last described waters, with respect to their harsh ferruginous taste at the fountain, and their loss of it in a short time, it is obvious to conclude, that that subtle Acid which uniting to the ochreous part, gives this harshness, flies off, or at least is separated much sooner, and consequently their Ochre is much sooner precipitated, than in the waters of the first and second Class; whereas, before this separation, the Acid united to the ferruginous parts at the fountain constituted a kind of Vitriol, to whose activity are to be attributed the purging and vomiting effects, rather than to their nitrous salts, of which these waters have but a very small share.

S E C T. IV.

MACCROOMP Water

IS situated about half a mile N. W. from *Maccroomp*, and sixteen miles W. from *Cork*, on the verge of a bog.

It

It is of a ferruginous taste, and lathers smooth with Soap.

On the spot it struck purple with Galls and Oak-leaves, but not when transported to *Dublin*, tho' it had blackned the Corks.

The Analysis.

A GALLON exhaled to a dryness, afforded about eight grains of an ochre-coloured matter, which yielded partly to the Magnet, and sparkled on the red hot iron, and being rubbed with *Sal Ammoniac* emitted an urinous smell.

Corol. This, as well as the three former, seems to have a *Natron* combined with its Iron, like the *Pouhon* spring at *Spa*.

It hath lately recommended it self by some well attested instances of its good effects in the cure of the Itch, and Scorbutic, and even of some scrophulous disorders, and in hypochondriacal cases.

The following is an authentic history of its good effects in a scrophulous case.

Smith's
nat. and
civil Hist.
of the
county of
Cork.

A girl of about ten years of age, had several large indurated glandular tumors under her jaw, and on one side of her neck, which did not give way to calomel, nor to purges, nor to a course of *Æthiops* mineral, and a decoction of the woods, nor to any external application; whereupon, in *May* 1748, she went to *Macroomp*, and drank the waters about the space of three months, at the end of which time, she returned perfectly cured. It kept her belly constantly open.

It was observable, that some of the places which had been healed, and were hard, unseemly cicatrices, suppurated and broke out afresh during this course, and healed smooth afterwards.

S E C T.

S E C T. V.

SUMMER-HILL Water.

AT or near *Summer-hill* in the county of *Meath*, is a water, of which a specimen was sent to *Dublin*, A. D. 1751.

At the fountain, it is of a strongly ferruginous taste and smell, like Smith's forge water, which is lost in bottles intirely in two days.

It curdled with Soap, but not with Milk.

After two days it gave no tincture with Galls, save a greenness descending deeper on standing a few days more.

The Analysis.

It deposited spontaneously not an ochre-like, but fusc sediment, which sparkled greatly on the red hot iron.

A gallon yielded by exhalation about thirteen grains of a grey matter, of a saltish taste, and an odd flavour; it did not sparkle on the red hot iron, as the sediment spontaneously deposited did, but smelt strong; it soon turned of a bright grass green, with Syrup of Violets, and smell'd strongly pungent, when rubbed with *Sal Ammoniac*, and somewhat pungent when rubbed with Salt of Tartar; It grew a little damp in the air.

Corol. It seems, like most of the foregoing waters of this Class, to have a little *Natron*, and a little Sulphur combined with its Iron.

It cured one girl of a Chlorosis, and another of a pain at the stomach.

S E C T. VI.

TEMPLEGE Water,

NEAR *Dublin*, was in considerable esteem, and much frequented for many years, but in the years

years 1749, and 1751, it sunk into entire neglect; and indeed this was not owing to meer whim (as has been the case of many others) but to a loss of its strength: for in the aforesaid years, it had very little taste, and Galls had scarce any effect on it

But tho' it be at present a lost water, yet as my situation near it enabled me to make frequent examinations of it both on the spot, and in *Dublin*, (two miles from it) the result whereof I apprehend may convey some instruction, I shall here give my observations on this water, tho' not in its present, but in its past and perfect state.

It was limpid when fresh drawn, but grew white on an hour's standing: it left something unctuous on the sides of the glasses; it was but of a weak ferruginous taste, of which it lost much on being exposed three hours in an open glass; and tho' it was formerly a custom to bring it for sale to *Dublin*, it could have been of little value, except taken early in the morning of the same day that it had been drawn, for I have observed some of it, which had been bottled and corked in the morning, to have lost the ferruginous taste in the afternoon.

Having been kept bottled, corked and rozined twenty-four hours, it exhibited plenty of very minute bubbles on the sides of the glass; and so did some that had been kept a month.

The specific gravity appeared to be a little less than that of the neighbouring river.

Soap lathered with it, but not without previous curdling: Oil of Tartar gave a white sediment, Spirit of Hartshorn, a brown one; the solution of Sugar of Lead a whitish sediment.

The solution of Silver turned it pearl-coloured; in another experiment, this mixture was of a dilute purple above, and wheyish below, and a brown powder was precipitated, viz. in the fresh water, which purple and brown colours, did not appear in the water that had

had been twenty-four hours drawn, a probable argument of some Sulphur in the fresh water, in concurrence with the following experiment. A piece of Lead and Bath-metal immersed twenty-four hours in a bottle full of it corked and rozined, acquired no change of colour, but a Silver studd acquired something of a blackish circle not easily rubbed off.

The Ivory Hydrometre frequently immersed in it grew blackish, as happens to a greater degree in the acid vitriolic waters, and which affords (with the experiment in the next paragraph, and some others) an argument of the presence of a dissolving acid in most or all the common Chalybeate waters.

The acids of Oil and Spirit of Vitriol, Oil of Sulphur, Vinegar, and Lemon-juice being mixed with this water, and then bottled, corked and rozined, and laid by three or four hours, exhibited plenty of minute bubbles; and it was very observable, that this effect was much more conspicuous in that water which had stood twenty four hours, than in that which was fresh taken up, the reason of which, seems to be, that the native Acid being soon lost by keeping, the calcareous particles predominate more, and form larger *molecule*, (as appears from the water's growing white on standing) and therefore excite a more sensible fermentation (a).

Syrup of Violets turned it of a light green.

Powder of Galls mixed in the proportion of five grains to an ounce and half of the water, gave a dilute claret-colour, which was deeper in the morning than with the same proportion of Galls in the evening.

Some of the water exposed only two hours in an open glass, gave a very weak tincture with Galls.

A small degree of heat destroy'd its property of tinging with Galls; for when it was made blood-warm, it gave a very faint tincture, and scarce any at all, when made of a simmering heat.

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It

(a) See the Chap. on *Dannard* water, which at the fountain betrays an Acid, which is soon lost by carriage.

It retained the tincture imparted by Galls in an open vessel but a very little while, for it very much faded on one hour's standing, and was entirely lost in six hours; and when it had been kept in bottles accurately corked and rozzined twenty-four hours, it gave a very pale purple in one experiment, and in two others no tincture at all.

It drew a well-flavoured infusion from green Tea in common with *Ballyspellan*, *Lucan*, and *Dunnard* waters.

The Analysis.

1. *Natural*. It threw up a yellow Scum to the surface.
2. *Artificial*. A gallon exhaled in different years, and at different seasons, yielded from twelve grains to twenty, of a whitish brown matter, and on the sides of the pan was a whiteness, shewing a mixture of calcarious Earth with the Ochre; and accordingly, boiling water being poured on it, when an hour calcined, acquired the sweet and rough taste of Lime water. The same whitish brown matter, is of a brackish taste, and imparts unto distilled water the taste proper to calcarious Nitre. It ferments and froths with Vinegar; it grows damp by keeping; it sparkles on the red hot iron; its Ochre is lost on being three hours calcined.

The proportion of the saline to the indissoluble parts was but small, viz. about as eleven to forty-nine.

Corol. *Templeoge* water was a Chalybeate, impregnated with a little Ochre, and a little marine Salt and calcarious Nitre, and a greater proportion of calcarious Earth than obtains in several of the stronger and purer Chalybeates, such as *Dunnard*, *Drumkit*, *Ballynasloe*, *Ballyspellan*, and than in *Islington* water near *London*, which it otherwise resembles, particularly, in having been in perfection only at the fountain, but it appears to have been somewhat weaker than the *Islington*-water.

Scholia. 1. Notwithstanding the evidences of Sulphur from some of the foregoing experiments on the water corroborated

corroborated by the following examination of its Scum, I have not inserted this among the minerals impregnating it, because it is in but small quantity.

2. It is said to have been of use in hectic heats.

3. This and other like weak Chalybeates in some weak and delicate habits might be justly preferred to the stronger; for whereas in some of those cases, it becomes necessary to dilute the *Pyrmont*, and other strong Chalybeates with water, nature here presents them to us sufficiently diluted for such as cannot bear a larger proportion of the mineral.

I shall here subjoyn some experiments, tending to shew the constituent particles of the Scum of this and other like Chalybeates.

*Experiments on the Scum of TEMPLEGE,
and some other Chalibeates.*

THIS Scum being carefully collected and dried, was of a yellow colour (in another red) with some shining (perhaps talcy) particles interspersed.

It had an odd flavour in the mouth, not easily described, tho' in another Chalybeate this was plainly ferruginous; it was somewhat unctuous like a bole, very light, (and so it was in another Chalybeate) even much lighter than flowers of Sulphur, and four times as light as an equal bulk of *Crocus martis astringens*.

N. B. This levity of the Scum of these waters shews, that the mineral matter constituting it, is in an highly attenuated state, according to the known maxim, that bodies upon being divided have their surfaces increased in a far greater proportion than their solidities.

It made a conspicuous ebullition, tho' small, with Spirit of Vitriol, and with Vinegar; with Spirit of Salt, a great ebullition, and withal turned yellow (as in the *tinctura Martis aurea*, prepared with *Crocus Martis*, and Spirit of Salt) and an infusion of Tea added to this mixture, turned it of a dark colour;

and Galls added to a decoction of the Scum in water with a little Spirit of Salt, instantly struck a deep blue colour, whereas, the meer scum infused or boiled in water, produced no such effect with Galls.

It has been a doubt, whether Chalybeate waters contain Sulphur or not. *De-beers* says, that the Scum of the *German Spa-water* emits a brighter flame than Sulphur; *Leigh* observes the Scum of several Chalybeates to be scarcely inflammable; but *Short* observes, that of *Astroe*, and some others, being dried and laid on a red hot iron in a dark room, to smok and emit a small blue flame with the smell of Sulphur, and to leave a little ferruginous Earth: and I observed, that the Scum of *Templeoge-water* dried, sparkled much, and stunk a little on the red hot iron, and the Scum of another of our *Irish* Chalybeates, I once observed to emit a blue flame: Again.

The dried Scum of *Templeoge-water* rubbed with Mercury and Turpentine, produced a much greater blackness than Mercury rubbed with Turpentine alone; and the dried Scum of another Chalybeate being rubbed between my fingers with a piece of Silver, this acquired a leaden hue, and those grew black: and lastly,

In order to try if something like Sulphur cou'd not be precipitated from an infusion of the Scum in water, I rubbed a little of it with Oil of Tartar *per deliquium*, then poured on this a little boyling water, and infused two days, whereupon it acquired a citrine-colour, to which Oil of Vitriol added, exhibited a small yellowish precipitation.

The same Scum turned from a yellow to a dark red colour, like *Crocus Martis astringens*, both on the red hot iron, and when five hours calcined in a Crucible, when also it yielded to the Magnet.

Corol. I. The above recited experiments on the Scum joyned to these on the water it self with the solution of Silver, and with Silver in substance, shew that
some

Some Sulphur enters into the composition of the mineral impregnating *Templeoge* water; from the red colour the scum acquires by calcination, and its yielding to the Magnet, appears its Iron; from its fermentation with acids appears its calcarious Earth; and from its greasiness its bolar; so that, upon the whole, this Scum is a composition of Iron, a little Sulphur, calcarious Earth and Bole.

2. Forasmuch as the Ochre or ferruginous parts are lost, upon calcining for three hours the sediment left on the evaporation of the water, whereas they remain in the Scum, even after its being calcined five hours, it seems that the ferruginous parts abound more in Scum than in the sediment, and being more attenuated and light, affect the upper part of the liquid (a).

3. From the transparency of this and other Chalybeate waters joined to the extreme lightness of the Scum, formed on the surface by stagnation, it appears that their Sulphur, Iron and Earth, are in an highly attenuated state, their surfaces on division increasing so much more in proportion to their solidities as to be, like leaf-gold, capable of swimming in a fluid, than which they were originally greatly specifically heavier, and from hence we may learn the great penetrability of these mineral substances, when suspended in the form of an invisible fluid in water (b).

4. Since the Scum infused or boiled in water does not give the water the vitriolic quality, or the power of tinging with Galls or Tea, but by the addition of an Acid to the Scum and water this quality is regained, it is highly probable, from this and other eviden-

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ces,

(a) Compare the account of *Bath* water in the general History of mineral waters, whose Ochre also is extremely light and volatile.

(b) See a further illustration of this matter in the Section on the *Witham* water in the said general History.

ces, that there is in this water taken fresh from the fountain, an Acid, which is lost by keeping.

S E C T. VII.

LUCAN Water,

NEAR *Dublin*, was another weak Chalybeate much like the preceding, formerly in some esteem, tho' lately neglected or lost.

The sequel is the result of an examination of it on the spot in the years 1739 and 1745.

It was of a ferruginous and rough taste.

Its specific gravity much as of the neighbouring river.

Soap curdled with it at first, but lathered soon after.

Oil of Tartar gave a whitish sediment, Spirit of *Sal Ammoniac*, a light brownish one, solution of Silver a large brown sediment.

The Acids both mineral and vegetable made an ebullition with it.

Syrup of Violets turned it green.

Five grains of fresh powder of Galls mixed with an ounce and half of it at eight in the evening, gave a faint purple, which in an hour after, was of the colour of high coloured beer. The same proportion of Galls mixt with it at five next morning turned it purplish, and stronger than in the evening, and the lower part of the mixture was of the tincture of high coloured beer.

Exposed in an open glass three hours, (a) it did not tinge with Galls at all, nor, when made scalding hot; also, what had been kept in bottles well corked and roined twenty-eight hours, had lost all chalybeate taste, and did no longer tinge with Galls.

It draws a grateful infusion from Tea.

The

(a) At *Dalphin's barn*, was a Chalybeate water, which lost the power of tinging with Galls, on being exposed in a glass an hour and half.

The Analysis.

1. *Spontaneous.* A blue and red scum appears on the surface on long standing.

2. *Artificial.* A gallon yielded twelve grains of sediment which was of a pale-brown colour, fermented with Vinegar, grew damp in the air, and acquired a reddish hue on being calcined two hours, which however it lost on another hour's calcination, nor did it, when thus calcined, yield to the Magnet, the little Ochre it has, like that of the *Templeoge* water, not standing the fire.

Corol. It was a weaker Chalybeate and less pure, (having a greater proportion of calcarious matter blended with its Ochre) than the waters of *Dunnard*, *Drumkit*, and several others,

S E C T. VIII.

A Water near MOUNTMELICK in the Queen's County

L YING a mile S. E. from the town, on the road to *Maryborough*, seems very nearly to resemble the two last waters in most appearances, viz.

It is at the fountain of a weak Chalybeate or inky taste, and lathers with Soap after curdling, precipitates a white cloud with Oil of Tartar, makes a considerable ebullition with Oil of Vitriol, and turns green with Syrup of Violets, effects proper to calcarious Nitre and Earth.

At the fountain, it turned blue with Logwood, and of a pale purple with Galls, but the tincture faded in a quarter of an hour.

In one experiment, after it had been kept fourteen hours, and in another, when it had been kept only two hours, it did no longer give any purple tincture

with Galls; but in another trial on two bottles filled *August* 18, 1755. at eleven in the morning, and opened in *Dublin* 52 hours after, one of the bottles tinged a pale pink-colour with Galls, tho' the other bottle gave no tincture.

The Analysis.

It carries a bluish scum.

A gallon exhaled left eighteen grains, in a subsequent experiment twenty-seven grains, of a brown sediment, which was of a brackish, pungent, and bitterish taste, was in some small parts attracted by the Magnet, fermented strongly with Spirit of Vitriol and Spirit of Salt; it smell'd strong rubbed with *Sal Ammoniac*, and on the red hot iron sparkled and emitted a suffocating smell; and as in the two last described waters, the little Ochre it has, is soon lost in the fire, viz. on an hour and half's calcination, and from brown it turned ash-coloured.

Scholium. Tho' here be a far greater proportion of contents than in *Dunnard* water, it is a much weaker Chalybeate, its Ochre being less pure, and blended with a greater proportion of absorbent Earth and Nitre.

It has been used medicinally for some years, and said to have been of service in the Gravel, and been observed to pass quickly by urine, and undoubtedly would have good effects wheresoever the weak light Chalybeates are proper, but it ought to be taken directly at the source, as it scarce bears carriage at all.

S E C T. IX.

MOUNT-PALLAS Water

IS situated in a bog at *Munt-Pallas*, (near the house of *Ignatius Pallas*, Esq: to whom the public is indebted for most of the following observations of its powerful effects) in the county of *Cavan*, about thirty-nine

nine miles from *Dublin*, about ten miles S. of the town of *Cavan*, eighteen miles from *Trim*, and three small miles from the town of *Old-castle* in the county of *Meath*.

It affords plenty of water, even in the driest weather, which is very bright and clear, and drinks very pleasantly till it is down, but leaves a strong ferruginous flavour after it. This was very strong when I examined it on the spot, even at a disadvantageous time, *viz.* at six in the evening, *June 29, 1739.*

It lathered with Soap, but not without previous curdling; it excited a minute ebullition with Oil of Vitriol, and turned green with Syrup of Violets, arguments of some calcarious Nitre and Earth.

On the spot, it turns instantly of a claret-colour with the fresh scraped powder of Galls, and purple with green Tea; but when it had been kept in a phial corked all night, it did not give any tincture with Galls; nay, the Gentleman aforesaid assures me, that tho' it be bottled, and closely corked at the well and brought to his house, which is but a musket-shot from it, it will have lost great part of its ferruginous quality, so extremely fugitive is that subtile *Menstruum* which dissolves, and keeps suspended the impregnating mineral; nevertheless, that it is strongly impregnated appears from hence, that it every night forms a fresh thick scum of all the colours of the rain-bow.

It passes swiftly by urine, and by stool with some that take large quantities of it, and is in great esteem this present year, 1751. having recommended it self by several notable cures, even in cases deemed deplorable by Physicians.

It is particularly excellent in restoring lost Appetite, and in curing Gleets; and there are several instances of persons far advanced in decays of flesh and strength, and loss of motion in the limbs, being restored by it, and some of these of great ages; and among them, one notable example, is given of a person in the last
stage

stage of a Consumption, recovered by drinking it in large quantities.

A Lady after a nervous Fever fell into great pains of the head and back, with privation of heat and motion in the lower limbs, with the *Fluor albus*, loss of flesh and appetite; and her stomach retained nothing that she took.

In this languid state, she betook her self to the use of this water on the spot, drinking three pints of it in a day; it first vomited, then purged her prodigiously, her excrements sharp and excoriating; it proved also diuretic, and her urine was highly fetid, like Smith's forge-water, but more intolerable; (a) in six days she found sensible benefit, and in process of time, was entirely restored in all respects.

Compare the accounts of *Iffington* water in my larger work.

S E C T. X.

BALLYSPELLAN Water

HAS been long in great repute, and much frequented, inasmuch, that in the year 1724. when Dr. *Taaf* published his treatise concerning it, it was called by way of eminence the *Irish Spaw*.

The spring is about half an inch in diameter, and flows out at the foot of the highest part of a mountain within eight miles of *Kilkenny*, which with the neighbouring hills and mountains, makes a ridge that runs nearly *North* and *West* about a mile's length, and in these mountains, there is an abundance of Iron-mine, and towards its exit, it passes thro' a rock of the *Lapis Hibernicus*, or *Irish Slate*, of which a specimen

Taaf's
Irish Spaw

(a) An appearance that may be solved by the operation of an Acid in the *primæ viæ*, on the Iron in the waters. See the characters of Iron elsewhere.

cimen transmitted to me by Dr. *Thomas Hewetson*, appeared to be a genuine Vitriolic ore, its infusion in water striking a blackish purple with Galls, and two drams of it being kept in a red hot crucible it neither sparkled nor flamed, nor emitted any notable smell, but lost thirteen grains, and from a dark-gray, was reduced to a pale brick-colour as the iron Earths, and then, and not before, exhibited many particles, which were attracted by the Magnet.

These experiments are here offered as a confirmation of the suspicion (a) elsewhere suggested of some such mineral as the *Lapis bibernicus* being a principal ingredient in our ordinary Chalybeate waters.

The water is of a ferruginous taste and smell, somewhat rough, with a slight bitterness in the throat, less rough than many other Chalybeate waters, and void of any vitriolic harshness, which Dr. *Taase* observes, as a peculiar recommendation of it, because, on this account, it will the more readily pass into the blood, and be less apt to turn the stomach, or offend the lungs or head in tender constitutions, as the harsher Chalybeates are apt to do; but indeed, that excellency is not altogether peculiar to this water, but belongs also to the lighter, or less strongly impregnated Chalybeates in general, of which further observation has discovered great numbers in this kingdom, and which are found not unfrequently to agree better than the *German Spa*, as participating less of the acid, and less loaded with the mineral, a difference very sensible in some delicate habits.

It leaves a Greasiness on the sides of the glasses used in drinking it, from the contained bolar or ochreous matter. It becomes quite effete on being a little while exposed to the Sun, so that cattle will then drink of it.

It

(a) Compare *Lisdone varna* and *Glanmole* waters, in relation to the same mineral.

It becomes weak on long drought, but on rain succeeding, as I observed after a plentiful shower, it presently becomes stronger, and strikes a deeper tincture with Logwood.

Exclusive of the ferruginous principle, it appears to be a comparatively pure water by the following observations.

It is a little lighter than a neighbouring Chalybeate at *Kilkenny*, for the Hydrometre stood in this last, at $3\frac{1}{2}$, when in *Ballyspellan*-water, it stood at 4. 0. It lathered instantly with Soap, and it exhibited no change with the Alcalies, volatile, or fixed, neither present, nor on standing all night.

Solution of Silver at the fountain changed it to a pearl-colour, afterwards red, with a whitish sediment; and in a specimen sent to *Dublin*, and examined the seventh day after being filled, it was bluish, as from a small quantity of ink put into the water; solution of Sugar of Lead, gave a pearl-colour at the fountain, and the mineral Acids produced no change in the water, save that it grew clearer. To this evidence of the absence of calcarious Earth in any notable quantity in this water, add, that Syrup of Violets gave it only a very light green.

Galls tinged it at the fountain, in *August* 1734, when I examined it on the spot, of a dilute purple, which on a little while's standing, grew more dilute. Logwood gave it a blue tincture, which was entirely lost in forty-eight hours, tho' kept in bottles well corked and rozined, and the tinctures with green Tea and Pomegranate bark were very much weaker in seventeen hours. In an experiment made *August* 18, 1755. Galls gave a light tincture of purple to some of the water, which had been taken up thirty hours; But in seven days (and doubtless in a far less time) it had entirely lost all ferruginous taste, nor did it strike any tincture, altho' some of the Corks were tinged black, as from Ink.

Dr,

Dr. *Dugan* assured me, that it putrifies and recovers it self on being kept a year in bottles, as I have elsewhere observed of several other Chalybeates.

Being boiled, it extracts a most grateful infusion from *Bohea* or green Tea, even as do several other of our light Chalybeates, as the *Dunnard*, *Lucan*, and *Templeoge* waters, tho' the ferruginous parts be dissipated in boiling the water.

The Analysis.

1. *Spontaneous.* It throws up a bluish and purplish Scum; and a yellow Ochre is sometimes collected on the surface of the water, which has been mistaken for Sulphur, of which this water gives little or no other tokens, at least far less than divers other Chalybeates. It deposited very little sediment in bottles kept seven days.

2. *Artificial.* A gallon exhaled to a dryness, gave only four grains of a pale dirt-coloured sediment, of which yet some parts fled to the Magnet, altho' a considerable part of the ochreous matter appears to be dissipated in the operation, even as happens to our *Templeoge* Chalybeate, and the *Bath* waters in *Somersetshire*.

The said sediment was of a brackish taste; it fermented with Spirit of Vitriol, and rubbed with *Sal Ammoniac*, smell'd a little pungent and greasy. It sparkled on the red hot iron.

Corol. It is a light and comparatively pure Chalybeate, with very little mixture of Earth or Salt, even less than what are commonly combined with the Iron in these waters. It is said to be as light as *Issington* water near *London*, and like it, soon loses its ferruginous quality, so that to reap the benefit of it in perfection, it is necessary to have recourse to the fountain.

Its operation is chiefly by urine, tho' sometimes by stool, and some times by sweat; and those who have
foul

foul stomachs, it sometimes vomits ; with some it passes only in bed.

It has been serviceable in loss of Appetite, perpetual belching, pains, weakness, and other disorders of the Stomach, in the Gravel, in female Obstructions, and divers under the most severe chronic disorders have been cured by it, particularly in hypochondriac disorders, Cachexies, Consumptions, the Evil, Colicks and Barrenness depending on obstructions ; and there are instances of recent Dropsies cured by it, and of stubborn Eruptions of the skin, tho' it increases them at the first use of it : among these, a gentleman of *Limerick* got rid of a loathsome Leprosy, by the internal and external use of this water. Another so far troubled with a Heat and itching in his skin, that he could hardly sleep, was cured by drinking it, and Dr. *Burges* long afflicted with Scorbutic blotches and other bad symptoms of that rebellious distemper, by a due course of this water and bathing in it, recovered a perfect state of health.

It has also been of use in Asthma's, in the hysteric Colic, and in the decline of Agues ; and I met with a remarkable instance of the efficacy of these waters in curing inveterate relaxations, viz.

A Woman aged forty, of a gross habit of body, was troubled with an inveterate and stubborn Gleet, wherein the parts seemed to be in a manner paralytic, tho' a troublesome itching attended also. She had used many medicines, and even the celebrated *Nevil-bolt* water in vain, but at length was greatly relieved by drinking this water two months one summer, and three another, she took six pints in a day, and sometimes interposed the use of the *Sal catharticus Glauberi*.

Burges's
Essay on
the Bally-
spellan
water.

It has often done wonders in obstructions of the Liver and common Jaundices ; but it is well observed, that this is not to be understood of the scirrhus and as it were petrified glands of the Liver or any other Viscus, or of Abscesses which are frequently found in
the

the very center of those indurated glandular parts; nor indeed does medicine know any but palliative remedies in such cases, which may, and ought to be administered, in order to render the remains of life as comfortable as possible.

But as the last cited Author mentions Tea, and recommends the use of green Tea during a course of these waters, it may be worth our while, once for all, to consider the propriety of this article of diet in this case, it being commonly, and for ought I know, without prohibition, used by the Ladies, which I apprehend to be very improper for the following reasons.

For as much as these waters are Iron in an highly attenuated state, or Iron intimately dissolved and suspended in the element, he that would convey such a solution with its native force undiminished into the blood, should take care, that no mixture may be permitted, which may hinder this intimate solution, attenuation or suspension of the particles of Iron in the water, but that it may be preserved entire, in order that the mineral impregnating the water may enter both the lacteal and meseraic vessels, the absorbent mouths of which last open into the cavity of the intestines, and convey the water immediately to the Liver. Now, whatever may be said of the stronger and harsher Chalybeates, there is a late curious experiment concerning the *Issington* waters (a light Chalybeate much like this) by which it appears, that the Bile and other juices found in the *primæ viæ*, do not cause any precipitation of the Iron contained in these waters, so that it seems that they do not suffer any notable alteration in the stomach and guts, by the mixture of the animal juices they there meet with, so as to hinder them from entering in their native state into the blood.

But since Tea, in common with all other astringents, doth actually and visibly destroy the attenuation and
suspension

suspension of the particles of Iron in the element, as appears by the purple, or dark-coloured cloud and sediment which they always produce in Chalybeate waters, which cloud and sediment are no other than an assemblage of the ferruginous particles of the water, and the astringent ones of the Tea, &c. which attracting each other, and forming grosser and more ponderous *moleculæ* than before, sink to the bottom of the glass, from whence it is reasonable to think, that by the mixture of the infusion of Tea and any Chalybeate water in the stomach and guts, the ferruginous particles, instead of being preserved in their state of attenuation and penetrability, will form grosser *moleculæ*, less fit to enter the mouths of the lacteals or absorbent vessels; I conclude, that during a course of these waters, physicians ought unanimously to condemn the use of Tea, and more especially in nervous disorders, for the cure of which they are justly celebrated.

The following practical hints from the two Authors above cited deserve attention, being applicable to the use of this and other waters of the same kind, *viz.*

“ It is not proper to go to the fountain before the Sun has dispersed the night-damps, nor to take it, or indeed any other remedy, till about an hour after fully waking in the morning, because it would give a check to a necessary perspiration, which in that very hour is greater than any of the twenty-four.”

Gorter de
perspirati-
one, A-
phor. 57,
338, 339,
340, 341.

“ The warmer seasons of the year are most favourable for a course of these waters, and it is to be doubted whether all the virtues of the spring will make amends for the checks of perspiration, which the colder and moister Summers will occasion; but there is one method of remedying in some measure this inconvenience which is also recommended to be done in cold flabby mornings, *viz.* to drink the waters in a warm chamber, or in bed.”

“ Those

“ Those of tender constitutions ought to begin their course of this water early, as they cannot bear the nipping cold mornings of *August* and *September*.

This last caution may admit of some exception or limitation from the variable state of the seasons in this climate, where our summers are not unfrequently protracted to *September* and *October*.

“ Aged and gouty persons that drink it, require great care to secure the stomach and defend the noble parts.”

Appendix to BALLYSPELLAN Water.

But as *Ballyspellan* is a cold mountainous tract, and not so well provided with accommodations for invalids as the delightfully situated city of *Kilkenny*, I shall here subjoin a short history of a chalybeate water found there, together with a comparison of it to the preceding water of *Ballyspellan*, in order to shew how far the one may be substituted to the other for medicinal purposes.

In the *College-meadow* at *Kilkenny*, on the banks of the river *Neor*, and on a marble quarry, on which is a blue clay, which on being exposed to the air stinks, is lately discovered a spring of this sort, yielding a plentiful supply of water, which by all experiments appearing to be a Chalybeate, Dr. *Thomas Hewetson*, sunk a pump on it in the year 1754. and secured it from any inundation from the river, except in great floods, whose examination of it at the fountain, together with my observations on divers specimens of it he sent me to *Dublin*, and withal of the *Ballyspellan* water which he sent, being willing to encourage these enquiries, I here annex.

At the fountain, it is of a ferruginous taste, and of a somewhat sulphureous flavour, or smells stronger of the mineral, than most other waters that taste as strong; but it is observable (as in the above water at *Mount*

M

Pallas)

Pallas) that it loses a good deal of the taste, on being carried only three or four hundred yards from the spot.

It did not discolour Silver immersed in it.

Also, at the fountain, it instantly strikes a dilute purple with Galls, Oak-leaf, and green Tea; but on standing an hour exposed to the air in an open vessel it grew tasteless, and did not strike any tincture with Galls; and in three different specimens transmitted me in *December 1754. May and August 1755.* one examined three days, another four, and a third, seven days after bottling, it had entirely lost the ferruginous taste, and gave nothing of the purple tincture with Galls, but turned wheyish, and on standing three days, a greenish colour appeared in the upper part of the glass, descending gradually to near half the depth of the glass (as in the nitrous waters) which last appearance from the Galls, did not happen in the *Ballyspellan* water, which had been taken up at the same time.

Also a bottle of the *Ballyspellan*, and of the *Kilkenny* Chalybeates, having been filled at the same time, and both opened at the same time, *viz.* thirty hours after, the *Ballyspellan* water was very limpid, and received a light tincture of purple from Galls, but the *Kilkenny* water was no other way affected by the Galls than in being rendered a little muddy: moreover, some of the Corks of the *Ballyspellan* waters seven days bottled, compared with those of *Kilkenny*, filled at the same time, the Corks in those of *Ballyspellan*, were blackened as from ink, which none of those of *Kilkenny* were, so that here are two evidences of *Ballyspellan* water, being the stronger Chalybeate: nevertheless, Dr. *Hewetson* assured me, that a bottle of the *Kilkenny* water being kept three weeks, recovered the Chalybeate taste, and again struck purple with green Tea, and sparkled in the Glass, *viz.* being in a fermenting

menting state, and having reabsorbed its precipitated Ochre.

The *Ballyspellan* water, is also a small degree lighter, the Hydrometre standing in it at 4. 0. when in the *Kilkenny* it stood at $3 \frac{1}{2}$.

The appearances with solution of Silver were pretty similar, indicating probably some pittance of Sulphur in both; for as the *Ballyspellan* water was struck of a pearl-colour, and afterwards red, and in another experiment bluish, the *Kilkenny* water also exhibited the like several appearances with that solution.

The *Ballyspellan* is a softer water, lathering instantly with Soap, which the other does not without previous curdling, to which agrees the experiment with the depurated solution of potashes, viz. which exhibits some slight crust on the sides of the glass with the *Kilkenny* water, but continues clear with that of *Ballyspellan*; and agreeable to this is the large white precipitation with solution of Sugar of Lead, and the deeper green struck with Syrup of Violets by this water, than by that of *Ballyspellan*. Lastly, the *Kilkenny* water, made some ebullition with Spirit of Vitriol and *Aqua fortis*, which *Ballyspellan* water did not.

The Analysis.

THE earth about the spring, is tinged red.

A gallon of this water exhaled to a dryness gave in one experiment twenty-two, in another twenty-five grains of sediment, which in one of the specimens was only of a pale dirt-colour, in another of a light-brown ochre-colour; and with Dr. Ryan, it was reddish; it was of a brackish taste, fermented and even frothed with Spirit of Vitriol, viz. much more than the *residuum* of *Ballyspellan* water did; it has some particles intermix'd which fly to the Magnet, but less than in *Ballyspellan*: it smell'd pungent when rubbed with *Sal Ammoniac*.

It sparkled and smell'd strong on the red hot iron, with Dr. *Ryan*, it flamed and burn'd black, and consisted of two parts, a red powder, and a white, and this last again for the most part was impalpable, tho' there was another part, viz. the smaller part, which was coarse and somewhat like Freestone, a composition in a great measure similar to what occurs in many, not to say most of these waters.

Corol. The *Kilkenny* water is impregnated with the same principles as that of *Ballyspellan*, than which it is a somewhat weaker Chalybeate, and the Chalybeate principle seems to be more fugitive, even than that of the *Ballyspellan* water; for which reason it ought to be drank immediately from the spring; but the *Kilkenny* water is stronger of the calcarious or absorbent principle than that of *Ballyspellan*, having from its situation near Marble or Limestone, licked up a greater quantity of the calcarious Earth and Nitre, as from the experiments with Galls, with the potashes, and with Spirit of Vitriol appears, whereas the *Ballyspellan* water situated higher and more among the ferruginous minerals has a somewhat greater proportion of iron with less mixture. Nevertheless the water of *Kilkenny* may undoubtedly in most cases be admitted as a proper substitute to the other, and promises to have good effects wherever the weak, light Chalybeates are proper, and to be a more powerful absorbent where acidity prevails.

The gentleman before mentioned, and Dr. *Ryan* assure me, that whereas it has lately been taken by several of the common people on the spot, it has been sometimes found to purge gently once or twice, and in some, it causes a transient head-ach; that it sits light on the stomach, and never chills the drinkers, and passes quickly by urine; and that some of the most puny and delicate constitutions have drank it with benefit, to which constitutions, it seems by the lightness of

of the impregnation to be best adapted, and that several have found benefit by it in disorders of the stomach, in loss of appetite consequent upon the Gout, Flatulency, in cutaneous Eruptions, in the Gravel, Scurvy, and in the Worms.

A Gentlewoman aged fifty, had been for more than twenty years troubled with a disorder of the erysipelatous kind in the legs, attended with great itching, and a large watery discharge; she found much benefit by an infusion of dwarf Eldar, and by drinking these waters, but the most sensible effect by the waters used alone,



A Table

T A B L E I.

In one view the principal Appearances of the *Irish* Chalybeates,

	Sensible quali- ties.	Specifick Gravity.	Alcalies.	Acids.	Syrup of Violets.
<i>Pyrmont.</i>	Taste acid, vi- nous, pungent, then austere and vitriolic, full of elastic matter.	Hydr. $4\frac{1}{2}$ and 3.0 when in distilled wa- ter at 52° in <i>Pouhon</i> water, at 4 $\frac{2}{3}$.	Soap curdles; sediment large, white, yellowish with Oyl of Tar- tar and Sp. of Sal Ammon.	A great ebul- lition with a- cids veget. and min. & greater than in the <i>Pouhon</i> water.	A deep green.
<i>Pouhon.</i>	Taste acid and vinous, then fer- ruginous or vi- triolic, plenty of elastic matter.	<i>Vide Pyrmont</i> , examined in <i>England</i> , light- er than com- mon water, as 1720 to 1723.	Soap lathered with a little pre- vious curdling: a subtile white cloud with both alcalies.	A great e- bullition.	Deep grass green, greener than <i>Pyr- mont</i> .
<i>Geron- sterre.</i>	Taste acid and vinous, with a smell like rotten eggs; abundantly replete with e- lastic matter.	Less than of <i>Pouhon</i> .	Soap lathered with a little pre- vious curdling: a subtile white cloud with both alcalies.	A great e- bullition.	Soon tur- ned green.
<i>Hamp- stead, near Lon- don.</i>	Of a strong fer- ruginous taste.	Less than of distilled wa- ter.	Lathered with Soap, and was clear with Sp. C. C. and Spir. Sal Ammon.	An ebulli- tion, heat and smoak, with Oyl of Vitriol.	Pale green with the dry'd flow- ers of Viola tricolor.

Irish Chalybeates

<i>Baily- borough co. Cavan.</i>	Of a ferrugi- nous taste, and fetid smell, four days old.				
<i>Drum- kit, co. Wick- low.</i>	Taste ferrugi- nous, six days old, and without fedor.		Lathered in- stantly with Soap, a small white cloud with Oil of Tartar.		Blue.
<i>Gran- shaw, co. Down.</i>	Taste ferrugi- nous, sparkled in the glass, kept a month in a bot- tle.		A sediment partly ochreous, and partly white with Spir. of Sal Ammoniac.		

Exhibiting

and some of the more noted foreign ones in Concert.

Solution of Silver.	Galls at the fountain.	Galls remote from the fountain.	Quant. of Contents in a gallon	Quality of Contents.
Sediment large, white, brown, and a copper coloured scum.	Deep purple, then black.	Deep purple, even in that a year old or more.	Gr. 145.	Ochre, iron, calcareous Nitre and alkaline Earth.
Bluish white, and a small white sediment.	A purple or brown reddish.	A purple above a year old.	Gr. 49.	Ochre, iron, a lixivial or urinous Salt, called Natron, and an alkaline earth.
A subtile wheyishness.	/	A claret colour.	Gr. 14.	Ochre, iron, sulphur, and the native alkali, stronger than in <i>Ponhon</i> ; or any other spring at <i>Spa</i> .
	Deep purple, deeper than the <i>German Spa</i> examined at <i>London</i> .	A dark reddish colour, after it had stood 6 hours in a vessel uncorked.	Gr. 6.	Ochre, and a pitance of <i>Vitriol</i> of Iron.
of the First Class.				
Only white grumes, tho' it tinged silver.		Claret-colour, four days taken up.	Gr. 19.	Ochre, Iron, Sulphur and Natron, the three ingredients of the celebrated <i>Geronsferre</i> .
		A violet-colour when six days old.	Gr. 6.	Chiefly Iron or Ochre.
	Very deep purple, almost black.	Purple, when kept 3 months, and had suffered rebottling.	Gr. 24.	Ochre, Iron, calcareous Earth, and a little marine Salt.

T A B L E I.

Exhibiting the principal Appearances of

	Sensible qualities.	Specifick Gravity.	Alcalies.	Acids.	Syrup of Violets.
<i>Killa- gbee, co. Down.</i>	Taste ferru- ginous.		Lathered, but with previous curdling with soap: whitish, & a small ochreous cloud with both alcalies.	Some very minute bub- bles with Oil of Vitriol and Spirit of Salt.	A bright green.
<i>Killeslin co. Carlow.</i>	Taste ferru- ginous, rough and bitterish, with a strong smell, some- what unctu- ous.		Soon lathered with soap: scarce any precipitation with the alcalies.	Scarce any e- bullition with Oil of Vitriol and Spirit of salt.	Deep green.
<i>Beltur- bet, co. Cavan.</i>	Taste ferru- ginous.		It lathered with soap after curd- ling, a subtile white cloud with both alcalies.	Some very mi- nute bubbles with oil of vit. none with spi- rit of salt.	Soon green.
<i>Bally- castle, co. Antrim</i>	Taste ferru- ginous and rough; with a fetid smell, 9 days old.	Less than of distill'd water; for the Hydr. stood in this at 5.8 when in distill'd wa- ter at 5.0.	Soap lathered soon. A subtile whyeishness, with the two alcalies.	No ebullition with oil of vit. nor spirit of salt.	A light green.
<i>Ramoan co. Antrim</i>	Strongly fer- ugin. without fedor 17 days old.				
<i>Ballypo- reen, co. Tippe- rary.</i>	A bluish co- lour, & ferru- ginous taste & fedor, like rot- ten eggs, 12 days old.		Soon lathered with soap: clear with alcalies in one Experiment; whitened with Oil of Tart. in another.	Scarce any e- bullition with oil of vitriol, spirit of salt or vinegar.	A bright willow green.
<i>Between Newtown Stewart, & Omagh, co. Tyrone.</i>	Taste ferrugi- nous & harsh: it retained the taste above a month.	A little less than of dis- tilled water, the Hydr. in this at 4.4 when in that at 5.0.	Soon lathered with soap. A brown and green grumous sedi- ment with both alcalies.	Plenty of bubbles with oil of vitriol, and spirit of salt.	Green- ish.

Continued.

the *Irish* Chalybeates of the First Class.

Solution of Silver.	Galls at the fountain.	Galls remote from the fountain.	Quant. of Contents in a gallon	Quality of Contents.
A subtle wheyishness.	Purple.	Deep purple, after being four months bottled.	Gr. 12.	Ochre, Iron, with a little marine Salt and Nitre.
Clear.	A deep purple, almost black.	A deep claret-colour four days old, and what remained in the bottom of the bottle 2 days aft. amber with Galls.	Gr. 24.	Ochre or iron, and a little sulphur, or rather bitumen.
A black sediment.	Deep claret-colour.	In a cask, a fortnight old, a shade of purple.	Gr. 30.	Iron, sulphur, and a little marine salt.
A small white grumous subsidence. Silver changed to a lead-colour.		A deep violet blue 9 days old, & in a bottle left half empty 2 days a deep almost violet purple.	Gr. 21.	Iron and sulphur, and a pittance of calcarious earth and marine salt.
		A deep pink-colour 17 days old.		
A blackish subsidence like ink, and silver turned like lead.	Deep purple.	Blue with Log-wood, above a fortnight old, & after the bottles had been several days opened.	Gr. 24.	Chiefly iron and sulphur.
A small blackish sediment.	A reddish black in frosty weather.	A purple, kept even in a small phial a month.	From Gr. 16 to 24.	Iron, or rather its vitriol, more manifest than in common Chalybeates, a little sulphur, marine salt, nitre and calcarious earth.

T A B L E I.

Exhibiting the principal Appearances of

	Sensible qualities.	Specifick Gravity.	Alcalies.	Acids.	Syrup of Violets.
Near <i>Strabane</i> co. Tyrone	Taste ferruginous, rough and bitterish, and not fetid, 18 days old.	Equal to that of distilled water.	Instantly lathered with soap, little change with alcalies.	No ebullition with oil of vitriol.	Blue.
<i>Badonie</i> , co. Tyrone	Strongly ferruginous, and not fetid 19 days old.		Instantly lathered with soap: a greenish cloud, & yellow greenish with the alcalies.		
<i>Tullyweel</i> , co. Fer-managh.	Strongly ferruginous without putrefaction, a month old.		It soon lathered with soap,		
<i>Coolauran</i> , co. Fer-managh.	Taste ferruginous, smell strong on dry weather.		Soon lathers with soap: a green, brown, floating grume, with solution of salt of tartar.		
<i>Mount-norris</i> , near Newry.	Strongly ferruginous, and not fetid, 6 days old.		Soon lathered with soap; nearly clear with solution of salt of tartar.		
<i>Killin-shawally</i> co. Fer-managh.	Pale brown, strongly ferruginous, without fetor, 3 months old.		Curdled with soap, and yielded a white, ochreous and green sediment with the alcalies.		
<i>Lisdonevarna</i> , co. Clare.	Of an attri-gent, ferruginous taste, and ferruginous smell.		No whiteness with oil of tart.	No fermentation with spirit of vitriol.	A faintish green.
<i>Clogh</i> , co. Wexford.	Taste strongly ferruginous, 3 days old, and not fetid.		Soap soon lathered without curds.		

Continued.

the *Irish* Chalybeates of the First Class.

Solution of Silver.	Galls at the fountain.	Galls remote from the fountain.	Quant. of Contents in a gallon	Quality of Contents.
Bluish with a small grumous precipitation.		Purple 18 days old.	Gr. 8 or 10.	Chiefly iron,
	Claret colour.	Claret-colour, 19 days old.	Gr. 8.	Chiefly iron.
	A bright red.	A deep purple a month old.		
	A purple.	A deep purple 6 weeks old.	Gr. 12.	Iron and a little sulphur, and vitriol more manifest than in the ordinary Chalybeates.
		Amber purplish 6 days old.		Chiefly iron.
	A fine purple.	Purple, four months old, even kept in a small phial, and partly in a warm room.	Gr. 31.	Iron, or rather its vitriol more manifest, & probably a little calcareous nitre.
Silver immersed acquired a blackishness.	A black purple	In that a week old well corked & waxed, much as at the well.	Gr. 40.	Iron, a little natron and sulphur.
	A deep purple.	A dilute claret-colour three days bottled.	Gr. 3.	Chiefly iron and natron. the ingredients of the <i>Pouhon</i> water at <i>Spa</i> .

T A B L E I.

Exhibiting the principal Appearances of some of the

	Sensible qualities.	Specifick Gravity.	Alcalies.	Acids.	Syrup of Violets.
<i>Tunbridge,</i>	Taste ferruginous and austere, in a dry season a Gas vitrioli perceptible.	In 3 vii $\frac{1}{2}$ ten grains lighter than rain-water, & 4 grains lighter than German Spa.			
<i>Lincomb near Bath.</i>	Of a pearl and bluish colour on standing: a light sulphurous smell first taken up; a ferruginous taste.	A little greater than of distilled water.	Soap curdled a little: a whitish yellow at the fountain, with alcalies.		Green.
<i>Ardmil-lan, co. Down.</i>	Clear: taste strongly ferruginous, but a little fetid, being three weeks old.	As of distilled water.	Soap lathered: the alcalies caused very little precipitation.	Little ebullition.	A little green at the bottom of the vessel.
<i>Bandon, co. Cork.</i>	Taste ferruginous: stinks on being kept a week.		Lathered soon with soap: little precipitation with alcalies.	No ebullition, but grew clearer.	Blue.
<i>Ballyna-roe, co. Wicklow.</i>	A strong ferruginous taste and smell, 12 hours taken up, which it retained 3 days, but much weaker.		Lathered smooth with soap: clear with oil of tartar.	No ebullition with oil of vitriol and spir. of salt.	Greenish.
<i>Baillyborough town.</i>	Of a ferruginous taste, and fetid, 4 days old.				
<i>Corlurgen, near Baillyborough, co. Cavan.</i>	Of a ferruginous taste.	As of a neighbouring soft, light spring.	Lathers instantly with soap.	A minute ebullition with oil of vitriol.	Greenish.
<i>Clonmell, co. Waterford.</i>	Of a ferruginous taste, and a little fetid, 6 days old.		Lathered smooth with soap: clear with oil of tart.	No ebullition with oil of vitriol.	Blue.

Continued.

English and Irish Chalybeates of the Second Class.

Solution of Silver.	Galls at the fountain.	Galls remote from the fountain.	Quant. of Contents in a gallon.	Quality of Contents.
	A blackish purple.	Soon deposits its ochre, & loses the power of tinging with galls.	From Gr. 6 to 9.	Iron, and probably marine salt.
A light coloured sediment. Silver immersed in the well was tinged.	A deep purple.	In 6 days reabsorbs its precipitated ochre, & strikes a deep purple again.	From Gr. 16 to 24.	Iron, a little sulphur or bitumen, and a small quantity of weak natron.
		Fetid and clear, having reabsorbed the precipitated ochre 3 weeks old: a deep pink-colour with galls	Gr. 8.	Chiefly iron.
A small white sediment.	Purple.	Pretty deep purple a week old, and somewhat putrid.	Gr. 15.	Iron, and a pittance of marine salt.
A subtile white cloud; yet Silver was tinged in the fountain.		Taken up 51 hours, a deep purple with galls: 3 days old a beer-colour, bottled 4 days no tincture.	From Gr. 8. to 12.	Chiefly iron and a little sulphur.
White grumes tho' silver was tinged of a yellow and lead-colour.		A claret-colour 4 days old, which it retained many days, but the water fetid.	Gr. 19.	Iron, sulphur and natron, as in the celebrated <i>Geronsferra</i> water.
Purple fresh from the fountain only.	A dilute claret-colour.	Bottled 24 hours, as deep as at the spring, but in 48 hours no tincture, or very little.	Gr. 12.	Chiefly iron.
	Purple.	Purple 6 days old, and a little fetid.	Gr. 10.	Chiefly iron.

T A B L E I.

Exhibiting the principal Appearances of the

	Sensible qualities.	Specific Gravity.	Alcalies.	Acids.	Syrup of Violets.
<i>Cardonnel, co. Down.</i>	Wheyish, very fetid, of a ferruginous taste, some weeks old, had reabsorbed its precipitated och.				Green.
<i>Dunward, co. Wicklow.</i>	Of a strongly ferruginous taste and bitterish, and smell somewhat sulphureous on rain succeeding great drought.		Lathered smooth with soap, no cloud with oil of tartar, but yellowish, as also with spirit of <i>Sal Ammoniac</i> at the fountain	No ebullition, except a very minute one with oil of vitriol.	A very light green.
<i>Dromore co. Down.</i>	Of a taste strongly ferruginous on the spot, 6 weeks bottled ferruginous and fetid.		Lathered with soap in one experiment, but in a dry season curdled.		
<i>Knockdrimagh, co. Carlow.</i>	Of a somewhat sulphureous smell at the fountain, and taste rough and bitterish, it retained the taste 24 hours bottled.		Lathered with soap: a straw colour, with a greenish circle at the surface, with spir. <i>Sal Am.</i> and sp. C.C.	Some very minute ebullition with oil of vitriol.	A little greenish.
<i>Wexford</i>	Of a ferruginous taste and smell.	As of distilled water.	Soon lathered with soap: clear with alcalies.	But little ebullition.	Blue, but greenish, on standing 48 h.
<i>Ballymascanlan, co. Louth.</i>	Clear, of a strong ferruginous taste and fetid, 10 days old.		Lathered smooth with soap instantly: almost clear with ol. tart.		
<i>Frankfoord, near Balliboy, K. C.</i>	A ferruginous rough taste, which it lost in 5 days in one experiment, but retained 7 days in another, without fetor, & was full of elastic matter.		Soon lathered with soap: some white sediment with the alcalies.	No ebullition with oil of vitriol.	Green.

Continued.

Irish Chalybeates of the Second Class.

Solution of Silver.	Galls at the fountain.	Galls remote from the fountain.	Quan. of Contents in a gallon	Quality of Contents.
A subtile wheyishness.		A deep claret-colour, some weeks old and fetid.	Gr. 11.	Chiefly iron.
Pearl-coloured, then reddish, & lastly a muddy brown.	A deep purple, almost black on rain after great drought.	Purple 2 days old in well corked bottles, but 4 days old, no tincture; yet kept above 4 years in bottles it recovered its taste, and struck purple with galls. and sparkled in the glais.	Gr. 4.	Chiefly iron.
	A very deep purple.	A purple 6 weeks old and fetid.	Gr. 14.	Iron, with a mixture of marine salt and nitre.
A white sediment.	A very deep purple, almost black.	Purple 24 hours old, a light purple 48 hours old, but in 3 days it lost the power of tinging with galls.	Gr. 13.	Iron, a little sulphur and marine salt, and vitriol more manifest than in some others.
A white grumous sediment.	Purple.	No tincture when 4 or 7 days old.	Gr. 19.	Iron, and a little marine salt and nitre.
	Deep purple.	Deep purple, 10 days old, and fetid.	Gr. 8.	Chiefly iron.
Blackish in one experim. in another a subtile yellowish cloud.		No tincture in one specimen 5 days old: a pale purple in another 7 days old. but which faded in a few hours.	Gr. 23.	Iron and marine salt.

T A B L E I.
Exhibiting the principal Appearances of

	Sensible qualities.	Specific Gravity.	Alcalies.	Acids.	Syrup of Violets.
<i>Kanturk co. Cork.</i>	Of a disagreeable nauseous smell and taste: 18 days old of a weak ferruginous taste, rough and bitterish, and in some bottles subacid, not fetid.		Lathered smooth with soap, no cloud with oil of tartar.	Some bubbles with oil of vit.	Blue.
<i>Tralee, co. Kerry.</i>	Ferruginous and fetid on carriage.	As of distilled water.	Soap lathered smooth.	An ebullition.	Green.
<i>Castleconnell, near Lim.</i>	Of a ferruginous and astringent taste.	As of the German Spa.	Curdled with soap: whitish with the alcalies.	Plenty of small bubbles with oil of vitriol, and spirit of salt.	Green.
<i>A. Farrel, co. Dublin.</i>	A pretty strong ferruginous taste, subastringent and bitterish.	As of the water of a neighbouring bog.	Lathered smooth with soap: clear with solution of salt of tart.	A very minute ebullition with oil of vit. and sp. of salt.	A light green.
<i>Garistown, co. Dublin.</i>	Pretty strongly ferruginous, subastringent and bitterish.	Very light.	Lathered smooth with soap: a subtle wheyishness, with oil of tart.		
<i>Kilmeaden, co. Waterford.</i>	A strong ferruginous taste, with an obscure acidity and briskness, which it retains one day bottled, and the ferruginous taste 48 h. in another exper. it retained the taste 8 days without fetor.		Clear with the alcalies.		
<i>Kilroran co. Roscommon.</i>	A ferruginous taste, and plenty of bubbles on the sides of the glass.		Lathers with soap, but with prev. curdling: a white cloud with oil of tart.	An ebullition with oil of vit. and a subtle white cloud.	Soon green.
<i>Curtlagh co. Dublin.</i>	Taste strongly ferruginous, & plenty of air bubbles on the sides of the glass. The taste strong 39 hours after being bottled.		It lathered with soap; a small ochreous sediment with the two alcalies.	A little ebullition with oil of vitriol.	Green at the surface

Continued.

Irish Chalybeates of the Second Class.

Solution of Silver.	Galls at the fountain.	Galls remote from the fountain.	Quant. of Contents in a gallon	Quality of Contents.
A white cloud tending to yellowish, and it tinged Silver at the fountain.	A deep crimson, tending to purple.	Eighteen days old, no tincture.	Gr. 5.	Chiefly iron and a little sulphur.
White, yellowish, and brown on carriage.	A deep purple.	A deep purple.	Gr. 10.	Iron, a latent sulphur, and marine salt.
Six months old, whitish, and then of a pink-colour.	Of a deep claret-colour.	Of the colour of ale 14 h. old: yet 6 mon. old recovered the taste & purpled with galls	Various, from Gr. 15 to 53.	Iron, calcarious earth and salt.
A light blue.	A pink colour	A pink above 14 hours old, but no tincture when 48 hours old.		
	A dilute purple.	No tincture 17 hours old.	Gr. 8.	Chiefly iron.
	Of a foxy brown, inclining to a copper-colour.	A deeper tincture kept in a bottle 48 hours than at the fountain, but in 3 days no tincture in one experiment, in another it gave a pink-colour, when kept 3 days	Gr. 18.	An ochry and sparry matter.
A white brown, and then purplish cloud.	A deep claret-colour.	A dilute purple 3 days old, and not ferid: the purple soon faded.	Gr. 15.	Iron, a little marine salt and calcarious earth
A white bluish cloud, and afterwards quite blue.	A very deep claret-colour.	Purple 39 hours old, but when 3 days old, only a faint shade of purple.	Gr. 13.	Chiefly iron, and a little marine salt.

T A B L E I.
Exhibiting the principal Appearances of

	Sensible qualities.	Specifick Gravity.	Alcalies.	Acids.	Syrup of Violets.
<i>Mount-rath, Q. C.</i>	A ferruginous taste, even 5 days old.		Soap curdles, but lathers after; a fine white cloud with the two alcalies.	A minute ebullition with oil of vitriol, and spirit of salt.	A pale green.
<i>Tierkelly co. Down.</i>	Of a ferruginous taste, and very harsh, which it retained 17 days, but was then fetid.		A smooth lather with soap: clear with oil of tartar.		Green.
<i>Glanmille co. Dublin.</i>	Taste strongly ferruginous and bitterish, very weak in the 30 hours bottled.		Lathered (smooth with soap.		
<i>Near Ashlone.</i>	A ferruginous taste in the fresh, and 6 days bottled without fetor, but plenty of an elastic vapor in the last.		Soon lathered with soap: whiten'd with both the alcalies a little.		
<i>Garry-luff, co. Dublin.</i>	Taste ferruginous at the spring and 18 hours bottled.		A smooth lather with soap.		
<i>Kilmaheoge. co. Dublin.</i>	Taste pretty strongly ferruginous, & lightly bitter.	Nearly as of the neighbouring brook.	Lathered (smooth with soap.	No ebullition with spirit of vitriol, nor <i>aqua fortis</i> .	A dilute green.
<i>Near Mac-crompt, co. Cork.</i>	Taste ferruginous.		Lathered (smooth with soap.		
<i>Between Castle-townshend and Skibbereen, co. Cork.</i>	Of a sulphureous smell and taste.				

Continued.

Irisb Chalybeates of the Second Class.

Solution of Silver.	Galls at the fountain.	Galls remote from the fountain.	Quant. of Contents in a gallon.	Quality of Contents.
A wheyish blueness.	Purple.	Purple 48 hours old: a pale pink 5 days old.	From Gr. 10 to 11.	Marine salt, nitre, calcarious earth and iron.
A small whitish grumous sediment.	A claret-colour.	A pale claret-colour, 17 days old, and fetid.	Gr. 11.	Chiefly iron.
	Claret-colour.	A pale pink 10 hours bottled, & 3 days old: no tincture.	From Gr. 10. to 12.	Chiefly iron.
	A light purple.	A pink-colour 6 days old, scarce any tincture 7 days old.	Gr. 16.	Chiefly iron.
		A pale pink-colour 18 hours bottled, & 3 days bottled, though weaker, yet the tincture durable.	Gr. 12.	Chiefly iron.
Bluish, and then pink-coloured, especially at the fountain.	A dilute claret-colour.	A dilute pink 24 hours old: and not quite lost in the 3 days old.	Gr. 8.	Chiefly iron.
	Purple.	No tincture, when it arrived in <i>Dublin</i> , viz. some weeks bottled.	Gr. 8.	Iron and natron.
Silver was tinged blackish.	A deep claret-colour.		Gr. 14.	Iron and sulphur.

T A B L E I.

Exhibiting the principal Appearances of some

	Sensible qualities.	Specifick Gravity.	Alcalies.	Acids.	Syrup of Violets.
<i>Islington near London.</i>	Of a ferruginous taste and somewhat styptic: some degree of briskness at the fountain in summer; brought to London, viz. 3 miles, will be foul and effete in an hour or two	Lighter than Tunbridge, as 1716 to 1718, and than common water, as 1716 to 1723:	Very little milky with oil of tartar.	An ebullition, heat and smok with oil of viuiol.	Green.
<i>Road, in Wiltshire.</i>	Of a sulphureous smell and ferruginous taste.	Like that of common water.			A grass green.
<i>Astrop.</i>	Clear, and of a ferruginous taste, with a briskness.	Lighter than common water at the fountain.	A white sediment with both alcalies.		A deep green.
<i>Witham in Essex.</i>	A strong ferruginous taste and smell, and a remarkable freshness at the fountain.				Green.
<i>Ballyspellan,</i>	Of a ferruginous taste and smell, rough and bitterish: something unctuous.	Very light.	Lathers with soap: no change with alcalies.	No change, except that it grew clearer.	A light green.
<i>Cappara Q. C.</i>	Of a ferruginous taste, which in 5 days is entirely lost.		Lathered with soap: almost clear with oil of tart.		A very dilute green.
<i>Lucan, near Dublin.</i>	Of a ferruginous taste, and rough.	As of the neighbouring river.	Lathers with soap, but with previous curdling: a white sediment with oil of tartar; a brown with sp. of SalAmmon.	An ebullition with acids mineral and vegetable.	Green.

Continued.

British and Irish Chalybeates of the Third Class.

Solution of Silver.	Galls at the fountain.	Galls remote from the fountain.	Quant. of Contents in a gallon	Quality of Contents.
	A light crimson, then a red purple, and lastly a black.	Tho' it strike a deep purple, it does not hold that tincture above half an hour, but precipitates a purple sediment.	Gr. 10 to 15.	Chiefly iron,
	A purple colour.	No tincture at any distance from the well.	From Gr. 30 to 60.	Iron, sulphur and natron, the three ingredients of the famous <i>Geronstere</i> water.
A pearl purple.	A deep purple.	Only a pink-colour carried a quarter of a mile from the well.	Gr. 17.	Iron, and a little calcarious nitre and earth.
A white sediment, which by standing turns black, in the fresh water.	A very deep purple.	No tincture remote from the fountain, tho' the bottles be ever so well corked and cemented.	Gr. 30.	Iron and sulphur, with a little nitre and marine salt.
Pearl-coloured, afterwards red, and then a white sediment.	A dilute purple.	On a little standing the tincture grows more dilute, and that with green tea and pomgranate bark was lost in 48 hours.	Gr. 4.	Chiefly iron.
A subtile small cloud.			Gr. 2.	Chiefly iron.
A large brown sediment.	A faint purple.	Bottled 28 h. no tincture.	Gr. 12.	A little iron, with calcarious nitre and earth.

T A B L E I.

Exhibiting the principal Appearances of some

	Sensible quali- ties.	Specifick Gravity.	Alcalies.	Acids.	Syrup of Violets.
<i>Temple- oge, near Dublin.</i>	Of a weak, fer- ruginous taste, somewhat unc- tuous.	Less than of the neighbour- ing river.	Lathers with soap, with pre- vious curd- ling: a white and brown se- diment with the alcalies.	An ebulliti- on with acids mineral and vegetable.	A light green.
<i>Near Mount- melick, Q. C.</i>	Of a weak fer- ruginous taste.		Lathers with soap after curd- ling: a white cloud with oil of tartar.	A consider- able ebullition with oil of vi- triol.	
<i>Mount- pallas, co. Cavan.</i>	Of a strongly ferruginous taste.		Curdled first, then lathered with soap.	A minute e- bullition with oil of vitriol.	Green.
<i>Holy- wood, co. Dublin.</i>	Of a taste strongly ferrugi- nous.				
<i>Ballyna- stoe, co. Wick- low.</i>	Of a harsh fer- ruginous taste.		Brought 14 miles lathered smooth with soap.		
<i>Grange- more, co. West- meath.</i>	A harsh, rough, ferruginous taste.		Curdled with soap.	A minute e- bullition with spirit of vi- triol.	Green.
<i>Dunse Spaw, in Scotland</i>	A ferruginous taste and smell.		A whitish se- diment with oil of tartar.	Some efferve- scence with oil of vitriol.	greenish.

In Page 3 of the 1st Table under Specific Gravity, 5.8 stands for $5\frac{8}{10}$, and 4.4 for $4\frac{4}{10}$, as usual in Decimals.

For a more minute comparison of the *Irish* with the *English* to the History of each Water, in my *General History*, or

Continued.

British and Irish Chalybeates of the Third Class.

Solution of Silver.	Galls at the fountain.	Galls remote from the fountain.	Quant. of Contents in a gallon	Quality of Contents.
Pearl-coloured, and a dilute purple.	A dilute claret-colour.	Kept in bottles well corked and cemented 14 h. no tincture.	From Gr. 12 to 20.	A little iron, with calcarious earth and nitre.
	A pale purple fading in a quarter of an hour.	Kept 2 hours no tincture.		A little iron, with calcarious earth and nitre.
	Purplish.	Kept in a phial corked all night, no tincture.		Ochre, iron, and a little calcarious nitre and earth.
	A deep violet purple, but soon fading.	No tincture 18 hours old.	Gr. 17. to 21.	Ochre, and a little natron, and sometimes a little sulphur.
	A dark purple.	No tincture 21 hours bottled.	Gr. 8.	Ochre, iron, and a little natron.
A deep dark red colour and brown sediment.	A deep claret-colour.	Little tincture in 32 hours.	Gr. 16.	Ochre, iron, some sulphur, and a little calcarious nitre and natron.
A milky-nefs.	A purple.	In 3 hours and a half, no tincture.	Gr. 12.	Ochre, and probably a little sulphur, and a marly earth.

and other foreign Chalybeates, the Reader may have recourse
Methodical Synopsis of Mineral Waters.

GENERAL OBSERVATIONS

On the PRINCIPLES of Chalybeate WATERS.

1. Tho' most of the foregoing waters contain other minerals, besides iron, I have given them only the generical name of *Chalybeate*, having always chosen to give each water its denomination from the most obvious and predominating principle; and indeed, from the foregoing accounts, their general similar nature abundantly appears, both in their impregnating minerals, and in their operations and virtues,

2. The *British* and *Irish* Chalybeates are impregnated with all the essential ingredients of the *German* waters, even not excluding the elastic Vapor, of which some are so fond, tho' Dr. Hales observes this to be a distinct principle from the Chalybeate, and seems to have but little share in the medicinal effects

See Dr. of the waters, and moreover, I am assured by some
Hume on late observations made on the *Pouhon* water upon the
the *Dunfer* spot, that this elastic matter which we observe in it
water. here, is in a great measure acquired by the bottling
and carriage, being far less considerable at the fountain.

The quantity of solid contents yielded by the evaporation of each water varies from four grains to sixty in each gallon; in some few consequently it is in a greater proportion, than in the *Pouhon* water from *Spa*, tho' in most far less, and in none equal to the proportion of solid contents yielded by the *Pymont* water.

It were however doing an injustice to the credit of our *Irish* Chalybeates not to observe, that this excess of the quantity of contents in the *German* waters above the quantity of contents in our Chalybeates, is not owing to their containing absolutely so much more of the Chalybeate principle, for both the *Pouhon* and *Pymont* have a considerable mixture of calcarious earth

earth and salts with their ferruginous parts, whereas several of ours have little or no foreign mixture of this sort, as is evident in the accounts above given of our *Dunnard*, *Ballyspellan*, *Ballynastoe*, and divers others, whose contents are a meer ferruginous Ochre with little or no foreign mixture, as appears from their lathering with Soap instantly.

3. Nevertheless, the quantity of solid contents yielded by each water upon evaporation is no absolute measure of the strength of the chalybeate impregnation; thus the waters of *Templeoge* and *Lucan*, tho' they yield double the quantity of contents that *Dunnard* and *Drumkit* waters do, yet the two first are much weaker Chalybeates than the two last, the reason of which is obvious, viz. the two first have a large proportion of calcarious Earth blended with the ferruginous parts.

4. Neither does the deepness of the tincture afforded by Galls, and added to any of these waters, seem to be a certain measure of the strength of the Chalybeate impregnation, or at least of the intimacy of the dissolution and mixture of the ferruginous particles with the element; for several of the above waters which give very deep tinctures with Galls, do very soon become effete, and lose their power of tinging with Galls, and very soon precipitate the tincture given, whilst several others which give weaker tinctures with the Galls, both retain their property of tinging with them much longer, and hold the tinctures given much longer; and therefore, in order to a just determination of the real strength of the ferruginous impregnation, it will be necessary to attend, not only to the tincture struck by Galls, but to the quantity of Ochre left upon the evaporation of the water.

5. A water's lathering smooth with Soap, and continuing clear with Alcalies (whereof we have many instances in this kingdom) is an indication of its comparative purity, or that it is little more than pure
element

element impregnated with Iron : (and accordingly several of the Chalybeates in the Table yield upon evaporation as few contents as the purest simple waters) on the contrary, its curdling with Soap, and yielding a white precipitation with Alcalies, manifests a calcarious Nitre and Earth, and the brown and green appearances from the admixture of Alcalies seem to be owing to the Ochre and Vitriol.

6. The solution of Silver is the proper precipitator of marine Salt from waters, which accordingly is manifested by the white grumous sediment exhibited on this mixture, as certainly as the calcarious Earth and Nitre are manifested by the white sediment with Alcalies ; moreover the solution of Silver turning purple with a water shews Nitre, according to Dr. *Short* ; but where it gives a dark-brown or black sediment, or where Silver in substance is discoloured by immersion, it shews Sulphur.

7. The ebullition with Acids seems for the most part to be owing to a calcarious or absorbent Earth, from which indeed but few waters are entirely free ; and their turning clearer with Acids, is an effect of a more intimate solution of their Earth by means of the Acids.

On the contrary, the want of ebullition with Acids in a water, shews that it is not impregnated with calcarious Earth to any degree.

8. The turning green with Syrup of Violets in most of the above waters seems also to be chiefly owing to the same principle, the fine absorbent Earth ; for tho' this be an equivocal appearance, and may be owing either to a native Alkali or Iron, or a calcarious Nitre, yet these last seem seldom to exist in these waters in quantity sufficient to effect this appearance.

On the contrary, where the Syrup of Violets continues blue with a water, it shews little or no admixture of the absorbent Earth with the ferruginous parts.

9. The

9. The presence of marine Salt in these waters (a very frequent ingredient, tho' in small proportion) I have inferred from the brackishness of the taste of the *residuum*, from the acid fume it emitted with Oil of Vitriol, from its readily imbibing the moisture of the air, and from the white grumous sediment precipitated from the water by solution of Silver.

10. The presence of *Natron* in these waters has been inferred from the *residuum* striking quickly a bright green with Syrup of Violets, from its lixivial taste, and from its exciting a pungent urinous smell, when rubbed with *Sal Ammoniac*.

11. Tho' some allowance ought to be made for a loss sustained by the evaporation of each water, so that the quantities above given, as contained in each gallon, do in reality fall considerably short of what the waters naturally contain, yet it must be owned, that the quantity of impregnating mineral in any of these waters is but small; so that in general, they should seem to be but a weak tincture or solution of Iron; yet as the minerals in these divine compositions are in an infinitely more attenuated and subtilized state than in the preparations of Art, they must have a greater power of penetrating the minutest vessels; and tho' the change of air, exercise, and relaxation from cares, must be allowed to have a considerable share in the good effects of these waters, yet the powerful and undeniable energy they have in the cure of most chronical diseases commonly baffling the best helps from pharmacy, must convince any one but a sceptic, that something more than meer water with those assistances, must be called in to account for these extraordinary virtues; and physicians well know the powerful operation of the mineral medicines, as Antimony, Mercury, and even Iron, in very small doses, and when properly dissolved and attenuated, especially, if a subtle mineral Spirit of prodigious activity be supposed to give energy to the grosser materials, of which Spirit our indigenous

digenous Chalybeate, and other mineral waters give the same general evidences as the foreign Spaws, and for a more copious illustration of this matter, I must beg leave to refer to my larger work.

12. But besides Iron, there are several other principles that enter into the composition of these waters, which deserve to be considered, as 1st, Air in most or all of them, tho' most in the *German*. 2^{dly}, A sulphureous vapor, manifesting it self by the giddiness or intoxication consequent on their use common to ours and the *German*. 3^{dly}, Tho' I have appropriated the title of *Acidulæ* to another sort of waters called Vitriolic, yet I am strongly of opinion, that a less manifest subtile Acid is to be found also in the common Chalybeates.

In the *Spa* and *Pyrmont* waters, this Acid is manifest by the taste, and in the *Pouhon*, even by distillation according to *Chrouet's* experiment recited in the Section on the waters of *Spa* in my larger work; and *Du clos* in his observations on the mineral waters of *France*, reckons up several of the ferruginous kind and others, of an acid and vinous taste, but thinks this acidity consists in a subtile vapor, which, upon reiterated careful trials on the waters of this sort, eluded all attempts of collecting it by distillation, tho' he mentions a water at *St. Mion* in *Auvergne*, which being carefully distilled, the first runnings collected in small quantity did tinge the blue tincture of *Tournsol* reddish, which is agreeable to the observation made on the *Chevron* water in the Section on the *Spa*-water turning red with Syrup of Violets, and my own experiment of our *Dannard* water at the fountain, destroying the blue tincture of *LignumNepbriticum*; and tho' but very few of our Chalybeates manifest an Acid to the taste, (which by the by is no disadvantage to them in some delicate subjects, to whom we not unfrequently find the acrimony of the *German Spaw* to prove too irritating) yet the *Tunbridge* and *Bath* waters
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in dry cold weather, and early in the morning have been observed to betray something of this kind called a *Gas Vitrioli*; and of the *Bath-waters* in *Somersetshire* it is well known that two parts of the water taken fresh from the Spring, added to one part of Milk just ready to boil, curdles it and makes the Whey prescribed to some of the more delicate and weakly patients there, and *Shaw* observes the plain Chalybeate water of *Scarborough* to curdle Milk if boiled with it; to which add what I have above observed in some of our strong Chalybeates of the county of *Permanagh* and *Tyrone*, that something like a Vitriolic Salt seems to be formed in them, and I noted one of these, even when brought to *Dublin*, to thicken, tho' not curdle Milk.

I am very well aware of what is alledged in relation to the generality of Chalybeates, that they preserve Milk from curdling, that many of them ferment with Acids, and turn green with Syrup of Violets, from whence they are by the moderns pronounced rather *Alcaline* than *Acidule*; nevertheless that there is more or less of an Acid, tho' enveloped by other particles, in most of them appears evident from the following facts. 1st, That an Acid is the proper *Menstruum* for dissolving both Iron and the calcarious Earth ordinarily combined with it, for, whatever has been said of filings of steel and water, I find Iron-mine to yield nothing of a property of tinging with Galls to water long infused in it, until an Acid be added, 2^{dly}, Acids added to these waters, commonly render them clearer, viz. by effecting a more intimate dissolution of their mineral particles, and hence it is that the mineral Acids added to these waters preserve them, viz. keep the Ochre and Earth longer suspended than their native *Menstruum* is able to do; and accordingly, 3^{dly}, Alcalies added to these waters, commonly precipitate the ochreous and calcarious particles manifest in the brown and white sediment usually observed hereupon, the probable effects of the alkali
running

running into the embraces of the native Acid, which therefore lets those mineral particles subside and coalesce in their proper colours.

But besides Acid, we may probably justly add Sulphur; for tho' I have never chosen to call a water *Chalybeo-Sulphureous*, unless it betrayed its Sulphur by the smell, or by discolouring Silver, having made it a rule to give denominations from the predominant qualities only, and accordingly as the following waters have betrayed a mixture of Sulphur with their Iron, I have pronounced them Chalybeo-Sulphureous, viz. the *Geronsterre* water in *Germany*, those of *Thetford* in *Norfolk*, of *Road* in *Wiltshire*, of *Witbam* in *Essex*, of *Dunse* in *Scotland*, and among our *Irish* waters those of *Ballyporeen* in the county of *Tipperary*, of *Kanturk* in the county of *Cork*, of *Lisdone Varna* in the county of *Clare*, and that near *Ballycastle* in the county of *Antrim*, and some others; yet that most, if not all, even the ordinary Chalybeates, do also contain Sulphur, if by this we understand any fetid and inflammable mineral substance appears.

1. From the examination of their sediment and scum above given; their sparkling on the red hot Iron, and in a bright white heat frequently flaming. 2. From the fetor, they acquire by keeping. 3. Because many of them which do not betray Sulphur by the smell, do yet manifest it by discolouring Silver kept immersed in their fountains, as hath appeared on tryals in several of them, and in all probability would also upon the same tryals appear in many more of those ordinarily deemed meer Chalybeates (a).

Next,

(a) I was further confirmed in my apprehension of Sulphur being combined with the Iron in ordinary Chalybeate waters, from a fact related to me by a person of veracity, viz. being present at the fountain of *Pouhon* in *Spa*, which is not in its natural state sulphureous to the smell, yet by merely filling a flask not quite full of

Next, an absorbent Earth is so conspicuous, even in most of them as to excite an ebullition with Acids, and so entitles them to the power of sweetening Acids, besides meer dilution. To this add, that few are without a mixture of marine Salt and calcarious Nitre, and several of them are impregnated with a native Alkali or *Natron*, as those of *Pouhon* and *Geronsterre* at *Spa*, *Ibetsford* in *Norfolk*, *Road* in *Wiltshire*, *Bournley* and *Hanbridge* in *Lancashire*, and several of our *Irish* Chalybeates; and this Salt entitles them to some degree, not only of an antacid, but attenuating and dissolving quality.

Upon the whole, the operations and effects of these waters are to be deduced chiefly from the predominating minerals, which are Iron, or a ferruginous Ochre commonly joined to a little absorbent Earth impregnating the element; and in several of our *Irish* waters the Chalybeate principle is found with either very little or no mixture worthy of notice; and tho' some other particles may adhere to the ferruginous, as those of calcarious Nitre, marine Salt, and sometimes *Natron* and Sulphur, yet in the greatest part, these are found in so small a quantity as scarcely to exceed the proportion in which they are found in Rain-water, and divers Spring-waters, so that in these waters which may be deemed simple Chalybeates, no considerable effect can justly be ascribed to any other principles.

13. The general operation of these waters is by urine, and altho' they are said to be commonly binding by stool, yet it is certain from experience, that they frequently purge at the beginning when taken fresh from the fountain, and this is not owing to the nitrous Salt, for it is found to hold in the comparatively

of it, and repeatedly strongly shaking it, and thereby expelling all its elastic matter, the remainder of the water in the flask became very fetid.

tively pure Chalybeates, and consequently seems rather to be owing to a kind of subtile Vitriol they contain, which is best qualified to act as such at the fountain, for at a small distance from hence, and a little exposure to the air, new combinations of parts ensue, the Ochre is precipitated, &c.

14. I shall conclude with summing up in one view the principal virtues of our domestic Chalybeates above described, in order to make a further comparison of them with the *German* waters.

Now it appears from the above detail given of the virtues of these waters, which meer chance in the empirical use of them, without prejudice in favour of any preimibed opinion, has discovered, that in the first place they are of great use in innumerable disorders of the *primæ viæ*, as Indigestion and Inappetence, Flatulency, Heartburn, pains of the Stomach and Bowels whether humorous or nervous, Vomitings, Diarrhæa's, Dysenteries, and the Worms.

Next, that they are of signal service in the cure of hypochondriacal disorders, dejections of Spirits and other nervous diseases, open obstructions of the Menses, and those of the Glands of the Mesentery, and of the Liver and Spleen, resolving beginning Scirrhus's of these parts, cure oedematous tumors of the Legs, beginning Dropsies, Cachexies, and the Jaundice; and there are frequent instances of their curing Asthma's, and some of the *Tabes*, whether from strumous tumors or purulent matter.

They remove concretions of Sand and Gravel, and stones not too large to pass; have cured some Ulcers of the kidneys, inveterate Gleets, the *Fluor albus* and Barrenness.

They strengthen the body at the decline of Agues and Fevers, and on weakness from Abortions.

Their success is universally acknowledged in Cutaneous disorders, and in the Scurvy properly so called, which is sometimes distinguished into hot and cold, the

the first *v. g.* from the use of spirituous liquors, and salt meats, the other from a diet of unripe acid fruits and farinaceous substances, and these waters seem adapted to the cure of both, being cooling in the one, absorbent, attenuating, and deobstruent in the other; and strengthening the organs of digestion (*a*)

They are also acknowledged to have been effectual in the cure of scrophulous Ulcers, (the reproach of physick and surgery) in tempering hectical Heats, and removing scorbutic and rheumatic pains.

These are the principal virtues which Chance has, upon repeated experiments, discovered in our native Chalybeate waters, which whosoever will compare with the virtues attributed to the *German Spaw*, will find the one to be little more than a repetition of the other.

Seeing then that our waters are both impregnated with the same principles, and by experience found to be possessed of the same virtues as the *German*, we may without rashness conclude, that the one may be very properly substituted to the other in most chronical diseases, with this peculiar advantage attending our own, that they may be drank at their respective fountains in the full possession of their native qualities and virtues, which is more than can be said of the foreign waters, tho' imported to us with the utmost care; and moreover, in some delicate constitutions where the acrimony of the *German Spaw-water* is sensibly felt and not easily born, our own Chalybeates, being generally milder and less loaded with the mineral, challenge the preference.

The Virtues of Chalybeate Waters in general.

I shall here subjoin a summary account of the virtues of the Chalybeate waters in general, from the

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testimonies

(*a*) They are recommended by the best authorities in the genuine Scurvy, and especially in hot temperaments. See *Lind's excellent Treatise of the Scurvy.*

testimonies of Authors, which will also appear to be little more than a repetition of the account of the casual effects above related of our several domestic Chalybeate waters, and so may serve as a confirmation of the truth of that account, *viz.*

They dissolve viscous and correct sharp humours, cool and temper the inordinate heat of the blood, invigorate a vappid blood without heating, strengthen the spirits, and give alacrity without inflaming, open obstructions, cure relaxations, and stop fluxes; but more particularly, they are excellent in disorders of the *primæ viæ*, whether from an Acid, or from redundant Bile, in restoring lost Appetite and Digestion, in the Heart-burn, Colicks, the Worms, in the Vertigo, and Epilepsies proceeding from disorders of the stomach or bowels; in the Gravel and other disorders of the kidneys and bladder, in the Jaundice, especially when attended with a sharp hot Bile, and in recent Dropsies, opening obstructions of the Liver, in Atrophies from obstructions of the mesenteric Glands, open obstructions of the *Menses*, and yet restrain their inordinate Flux proceeding from too great heat and acrimony of the blood.

As a corroborating medicine, they are of use in restoring strength after Fevers continual or intermittent, in preventing Abortions, and in the cure of Diarrhæa's, Dysenteries and spitting of Blood, Gleets, the *Fluor albus* and Diabetes.

They are excellent in the cure of hypochondriac and scorbutic diseases; *Hoffman* particularly affirms, that they are the best remedy known in the cure of the Scurvy, being joined to a proper diet and regimen.

They have been taken with good effect in Asthmas, Coughs, and Hectics, especially mixed with milk, and even in Consumptions of the Lungs not too far advanced, and especially those which proceed from scrophulous tubercles.

I shall

I shall next give some hints relating to the method of using Chalybeate waters, and some cautions in drinking them.

1. The Chalybeate as well as other mineral waters ought not to be considered as a meer empirical remedy, but a branch of the *materia medica* to be subjected to a rational administration, with a due regard to the constitution, habit, age, sex, disease and state of the disease, the weather, and other circumstances cognizable to the sagacious physician, for want of an attention to which, their success proves precarious and sometimes unhappy.

2. In most or all cases, but especially in the decline of life, in weakly constitutions and cold and moist temperaments, where there is not heat enough to give activity to the waters, in the Stone and Gravel, in Dropsies, Consumptions, Asthma's, and in Gouty habits, the use of these waters without proper advice is dangerous.

3. In inveterate confirmed scirrous and hard stony concretions, and in the last stage of Consumptions, our Art seems to furnish no internal remedies, but the palliative, and therefore the ill success that attends these waters in such cases is not to be wondered at.

4. It is of great moment, in order to obtain the utmost efficacy of most or all our Chalybeate waters, that they be drank immediately from the fountain, for it is incredible, but to those who have accurately enquired into these matters, how soon that subtile *menstruum* that dissolves, keeps suspended, and consequently gives activity to the mineral, is dissipated, at least in some degree, by its removal to a small distance from the fountain.

5. The season of the year for drinking, is from *May* to *August* inclusively, and even to *September* and *October* in this country, when a warm summer-like autumn succeeds to a wet summer, as frequently hap-

pens, and serene dry weather is to be preferred, altho' it is observable, that long continued drought, or long continued rains do equally weaken the springs.

They are to be drank in the morning about an hour after rising, and an hour or two after sun-rising.

In cold and wet summers (such as are frequent here) they should be taken, especially by the tender and delicate, in bed or in a warm chamber; and they may be thus taken in cases of necessity, even in winter, especially in frosty weather, when they are strongest of the mineral.

6. A due Preparation of body by either bleeding or purging, or both, ought to be premised to the use of the waters, and a cathartick (which is to be of the mild sort, and such as may not impair the strength) may be interposed every 8th, 10th, or 12th day, in order to expedite the passage of the waters: it will also be requisite to purge at the end of the course.

7. In some languid, and in some debauched stomachs, it may be necessary to warm the vessel a little out of which the water is drank, and moreover, it may be expedient to add a little of some aromatic bitter in tincture to the first glass, as *tinctura amara*, or *aromatica*, or to chew candid Orange, Angelica, Ginger, &c.

8. The Dose in which these waters are to be taken admits of great latitude, viz. from half a pint to a pint, a quart, or even four or six quarts, and all to be taken entirely or chiefly in the morning: the general rule is, to keep within that quantity which shall be found to load either the bowels or head, or not to pass freely.

Where meer corroboration is wanted, and where there may be danger of increasing the discharges, or any evacuation, the dose may be from half a pint to a pint, a pint and half, or a quart, and in some cases, where the long-continued use of the waters may be
injurious

injurious, it may be convenient to intermit them for some days, or even for a month, and then return to them again.

It is most prudent to begin with small doses, as with half a pint, and gradually to increase the quantity until one arrive at his utmost allowance, and afterwards to diminish the daily dose by the like gradations.

9. A strict regimen in diet is to be observed during a course of Chalybeate waters, with moderate exercise; the appetite excited by the waters ought not to be indulged. All foods of hard digestion, Legumes, Fruits, and most garden-stuff ought to be avoided, and late hours; suppers should be light and early, or none at all, in order that the stomach may be fit for the reception of the waters in the morning.

A glass of wine or two, may be indulged after dinner, especially when large quantities of water have been taken.

A milk diet is very compatible with any of the mild Chalybeates, such as ours mostly are, having little or nothing of the vitriolic acidity; but I condemn the use of Tea during this course, because it precipitates the mineral, and moreover is particularly hurtful in nervous cases, in which these waters are very much and very justly recommended.

A course of these waters may be continued for six, eight, or ten weeks, and even for four months or longer, and repeated for a series of years: And

After the conclusion of the course, the patient is advised not immediately to abandon himself to his usual way of life, but persevere in the same regimen as at the Spaw for a month or longer after his return home.

 BOOK III.

Of the WATERS most properly to be called Acidulæ, and First,

OF THE
VITRIOLIC WATERS.

FOR a more minute account and description of the waters of this Class, I must refer my reader to my *General History of mineral Waters*. However, as these waters are frequent in this country, and more numerous than they appear to be elsewhere, according to the accounts left us of the mineral waters in foreign parts by Authors, (tho' whether this difference proceed rather from want of enquiry after, than the real scarcity of them abroad, must be left to further observation, in the mean time) as the number and variety of these waters here has given an opportunity of a minute enquiry into their nature, operations and virtues, I shall give such observations and experiments concerning them as my leisure would permit me to make, and the rather, because, as they are less known, their nature and use is less understood, and first

SECT. I.

Of an Acid Water from the County of WICKLOW.

IN September 1737. I received from the neighbourhood of the town of *Wicklow*, a water from a spring there near the sea, which altho' not long discovered

covered, until by the unlucky industry of some covetous persons, in digging a trench near it, in order to have secured to themselves the property of the well, it was lost; (a) yet as the following observations and experiments on it, will serve to shew the correspondent or analogous nature of this and the following waters, I shall here subjoyn them.

It was of an amber-colour, of an acid, and acerb taste, and bore carriage.

It curdled with Soap, and with Oil of Tartar *per deliquium*, Spirit of *Sal Ammoniac*, and Spirit of Hartshorn, but made no ebullition with the Alcalies, being too far diluted with water, for we shall see anon, that the *residuum* and Salt did ferment with the Alcalies.

The water boiled with milk curdled it strongly.

It instantly turned blue with tincture of Galls, and so did the solution of its Salt with Pomegranate flowers; with green Tea, the water turned blackish, with Sumach greenish, with Syrup of Violets greenish, five drops to a tea spoonful of tincture of Ash-bark in water, changed this from a citrine-colour, on placing it between one's eye and the light, to a deep grass-green: the blue paper turned the water to a muddy green.

The Analysis.

THE *residuum* left on its evaporation to dryness was of a strongly acid, and styptic taste, and withal brackish from the sea-water that overflowed it, and fermented with Alcalies. It was of a dirty greenish colour, and by calcination turned very red, like the *Colcothar Vitrioli Anglicani*. It shew'd its Sulphur by its fetor on the red hot iron, and by a Silver spoon's acquiring a blackness by immersion in a mixture of the *residuum* and common water.

O 4

The

(a) In 1741, it was opened again, but much weaker than at first, being mixed with sea water, &c.

The *terrestrial* matter separated from the saline, caused no ebullition with Spirit of Vitriol.

The *operation and virtues* of this water appear by the few casual experiments that have been made on it to be much like those of the other waters of this Class, it having been used with success in Inflammations of the eyes with flux of humours, and in Ulcers of the legs by washing, which it dried and disposed to heal.

Some also adventured to take it inwardly to the quantity of a pint, one of which it only griped, another it purged.

S E C T. II.

CROSS or CROSS-TOWN Water in the County Waterford.

THE spring rises two miles and half S. E. from *Waterford*, at the edge of a bog called *Cross-bog*, or near *Cross-town*, or half-way-house between *Waterford* and *Passage* in the barony of *Gaultier* and county *Waterford*, on the estate of Alderman *Samuel Barker*, who transmitted the water to the *Physico historical Society* in *Dublin*. It was discovered in the year 1743, in digging up a piece of bog timber.

There are several springs of this water in the bog, of different degrees of strength, but all vitriolic, as will abundantly appear from the following examination of different specimens of it transmitted to me at different times.

It is limpid, not of a brown tincture, as several stronger waters of this Class, of a taste moderately acid, (tho' on exhaling the aqueous parts, it becomes very acid) austere, ferruginous and sweetish, somewhat like white Vitriol dissolved in water; it bears carriage very well, as do all of this Class; for some of it kept above a year in flasks ill corked, tasted as rough as at the well.

Kept

Kept a year, it was somewhat fetid, and had the flavour of a boiled egg, like the sulphureous waters, but did not tinge Silver.

It was so little loaded with the Acid, that tho' in one specimen, it curdled with Soap, in two others, it lathered with Soap, nor did it ferment with the Alkalies, but in one specimen, continued clear a good while with them, tho' upon standing, an ochreous flying grume appeared; In another specimen, the solution of Salt of Tartar exhibited a yellow greenish ochreous cloud, and spirit of *Sal Ammoniac*, a small ochreous yellow sediment, as did also lime-water, tho' less.

Galls immediately struck a deep blue with this water, both at the fountain-head, and with that which had been taken up six weeks, and that which had been kept above a year in the bottle: also the powder of Galls had the same effect on the water, when it had been four hours on the fire, and lemon-juice destroyed the blue tincture produced by the Galls, and restored the water to its transparency.

Sumach produced nearly the same colour as Galls, green Tea a dun-colour, Logwood in two samples struck an olive, or dun-colour, in one sample a red.

The water was clear with solution of Alum.

Oil of Vitriol precipitated a subtile cloud, and in one experiment, excited a fermentation, as did also Spirit of Salt, (tho' this did not succeed in other trials) as tho' here were a mixture of calcareous matter.

The solution of Sugar of Lead, turned it wheyish, and in another sample, exhibited a small ochreous flying grume.

Solution of Silver exhibited a gross white cloud and sediment.

Milk was not curdled by it in one sample, tho' it was in three other samples, but with a turbid whey, so that in this and other instances this water manifests a less degree of acidity than most waters of this Class:
thus

Thus also it produced but a small degree of coagulation with *Saliva* and with *Albumen Ovi*.

The specific gravity appeared by the Hydrometre in one experiment, to be but little greater than that of distilled water; but in another sample it was less.

It did not discolour Silver immersed in it, as several other waters of this Class did, neither did the Mud of the well tinge Silver; but a knife immersed half an hour became variegated with copper-coloured streaks.

The Analysis.

A GALLON at a medium, on four different samples of the water, gave about forty grains of *residuum*, partly olive-coloured, and partly green-whitish, with some ochreous spots on the sides of the pan, of a strong smell, of an acid, austere and vitriolic, ferruginous taste, and in one experiment bitterish withal.

The *residuum* of one sample of the water excited no ebullition either with Acids or Alcalies; but the *residua* of two other samples made a conspicuous ebullition with the solution of Salt of Tartar, tho' none with Spirit of *Sal Ammoniac*.

Two grains of the same *residuum* curdled an ounce of milk.

The saline parts separated from the indissoluble ones by distilled water, as usual, had the appearance of a *Vitriolum trichites album*, or a white efflorescence like Hairs, of which I obtained thirteen grains to four of the indissoluble matter.

The Salt thus separated from one sample of the water made no ebullition with either of the Alcalies, tho' from another, it did ferment with the solution of Salt of Tartar, but not with Spirit of *Sal Ammonia*, so that it is far less acid than the Salt obtained from the waters of *Shadwell*, *Swanzy* and *Wicklow*: accordingly, it moistened but a little in the air; yet it melted and rose in blisters on the red hot iron as *Vitriol*

triol, and half a dram of it boiled in half a pint of milk curdled it with a clear whey.

The indissoluble matter left in filtre, dried was quiet with Oil of Vitriol: it was by calcination reduced to a pale brick-colour, and was then attracted by the Magnet.

Corol. Cross water is impregnated with a native white Vitriol, both in a very moderate proportion, or greatly diluted, and endued with a very moderate degree of acidity: here is also a subtile Sulphur, and probably some small admixture of Copper.

As to the *operation and virtues* of this water, thus much has been determined from casual experiments; some who took large draughts of it vomited, another it purged; and on others it had little effect or proved diuretic only: and indeed as this water is evidently weaker, not only in the smaller proportion of vitriolic Salt it contains, but also in the less degree of acidity it possesses, than the waters of *Shadwell*, *Kilbrew*, and several others of this Class, and has less coagulating effects, it is therefore no wonder that it should frequently prove not emetic or cathartic, but only diuretic; and on the same account be safer in internal use, and better adapted for an alterative.

It has had good effects not only in the *Fluor albus*, but also in suppressions of the *Menses*.

A. B. aged 52, on hard riding, and other fatigues, had lost his appetite and flesh, and fell into the Jaundice, accompanied with the usual symptoms; he drank a pint of this water in a day for fifteen days, and tho' it had no sensible operation but by urine, it removed all complaints; he recovered his flesh, appetite, and strength, and continued well for two years, which was the time when I received this information; from whence it appears, that the internal use of such waters is not wholly to be condemned.

Smith's
nat. and
civil Hist.
of the C.
of Water-
ford.

S E C T. III.

COSHMORE Water in the County of Waterford

IS from a spring situated on the mountains of *Coshmore* in the parish of *Modeligo* about three miles N. of *Cappoquin*, about midway between the last named place and *Clonmel*.

The water is limpid, of an acid, sweet and austere taste, like that of white Vitriol dissolved in water, and this taste it retained equally after having been taken up six weeks as at the fountain-head; and moreover, quite otherwise than the common Chalybeate waters, was not at all fetid on being so long kept.

It curdled greatly with Soap, turned green and yellow with the solution of Salt of Tartar, and precipitated a brown and green grume, as it did also with Spirit of *Sal Ammoniac*, even as happens to a solution of green Vitriol mixed with the same Alkalies.

Milk boiled with equal parts of it was curdled, but obscurely.

It had blackned the Corks of the bottles in which it was sent me, and turned of as deep a blue with Galls in *Dublin* as at the fountain-head. It extracted a reddish colour from Logwood, but soon vanishing.

It's specific gravity, like that of *Cross-water*, appeared to be less than that of distilled water, for the Hydrometre stood in it at 7. 0. when in the distilled water equally exposed, it stood at 6 $\frac{1}{2}$.

The Analysis.

ON exhaling to a dryness, the proportion of a gallon yielded forty-eight grains of sediment, which in the upper part of the pan was of a dark greenish colour, and underneath white. It was of a strong, acid, sweet, vitriolic taste. It made an ebullition with Salt of Tartar, tho' none with Spirit of *Sal Ammoniac*. It curdled milk with a clear whey in the proportion of half a dram

to half a pint of milk. The solution of it struck presently blue with Galls.

Corol. *Cosbmore* water is a solution of native Vitriol, in most or all respects like the *Crofs* water.

It's operation appears to be like that of the other ^{Smith's} nat. and waters of this Class; for some of the country people ^{civil Hist.} accidentally drinking of it, it vomited one of them, ^{of the C.} and made one or two more extremely sick. ^{of Waterford.}

S E C T. IV.

The Acid Water near NOBBER.

ANOTHER remarkable water of this Class issues from a spring in the county of *Meath* at *Curragh-duy* or *Corra-duy*, or *Castletown* near *Nobber*, about a mile from *Kilmainham*, and within five or six miles of *Ardee* near *Carr's-mill*, from whence it is sometimes called *Carr's-well*, which I visited, June 20. 1739.

In the neighbourhood is said to be a sulphureous turf, and not far from it some *Irish* Slate.

It was a pale brown colour, of a strongly acid, very astringent, and withal sweetish taste, resembling as it were a mixture of *Copperas* and *Allum*. Another sample of it procured *October* 20. on a long continued series of dry weather, tasted predominately sweet, rough and inky, less acid: and in 1744. the water was less strong, having been weakened by their digging for turf in the neighbourhood, a practice not unfrequently destructive of some springs of inestimable value.

It is observable that there is also within nine yards of this spring, another of a very different nature, viz. a comparatively soft *Chalybeate* of the ordinary kind, so far from having any claim to the appellation of an *Acidula*, that like the rest of the common *Chalybeates* it is truly *antacid*.

But

But to return to the acid water near *Nobber* : It does not ferment with the saline Alkalies either volatile or fixed, and so falls short of the acidity of the waters of *Haigh*, *Shadwell* and *Kilbrew* ; yet it excited some ebullition with the powder of Oyster-shells prepared, as well as precipitated an Ochre therewith, and the acidity of the water is thereupon greatly abated : so levigated Lime-stone precipitated the Ochre from the water, and greatly abated its acidity.

The other Alkalies, *viz.* solution of Salt of Tartar and Spirit of *Sal Ammoniac*, exhibit a large ochreous precipitation from it ; and when Oil or Spirit of Vitriol was added, it restored the transparency, even as a solution of *English* Vitriol precipitates a large green curd with Salt of Tartar, to which if Oil of Vitriol be added, the curd is dissolved, and the mixture becomes transparent.

Lime-water effected little or no present change with this water, but next morning, there was a small brown sediment, tho' much smaller than from the Oil of Tartar and Spirit of *Sal Ammoniac*.

As to the other usual precipitators, *viz.* solution of Silver, and solution of Sugar of Lead, the first turned it milky, and next morning yielded a small white grumous sediment, and the second gave only a small subtile yellowish precipitation.

Vinegar added in the proportion of half a dram to six drams of the water changed it instantly green ; Oil of Vitriol destroyed the native amber tincture, and rendered it limpid like water : *Aqua fortis* had the same effect. The solution of Allum produced no considerable change, as neither did the solution of *English* Vitriol, except some very minute subsidence next morning.

With certain *animal substances*, the appearances were as follows : Boiled with equal parts of milk, it makes a clear posset, and not an unpleasant one : It also coagulates the *Albumen ovi*. It blackens the stools of those
who

who drink it, as it does also the teeth, and blackens and corrodes Ivory frequently immersed in it.

Galls instantly changed this water, whether fresh, or kept many days or weeks, to a deep blue; they also turned it blue after it had been an hour upon the fire: thus it bears heat, and moreover it also bears cold far better than the *Pyrmont*, or any common Chalybeate water; for when it had been congealed in the great frost in 1739. it still retained the acid and austere taste, tho' less intense, and struck blue with Galls. See the like experiment on the *Swanzy* water in my general History.

The bowl of Sycomore-wood into which it was poured was immediately tinged black.

Tormentil-root whether dry or green, and in different proportions, always struck it of a deep green, tho' the surface of the root was turned black.

Green Tea also gave it a green colour, which on standing became dun. Sumach turned it of a deep green, and the leaves of Bramble gave it a slight green.

Scholium. 1. The Greenness exhibited by so many of the Austeres, gives suspicion of a mixture of venereal Vitriol.

2. I diluted this water with three times its quantity of common water, and it still struck of a deep blue with Galls, and so it did when I diluted half an ounce of it with half a pint of common water, but it was slower in striking, and of a paler blue; but when I diluted half an ounce with a pint of water, it struck only purple, like an ordinary Chalybeate water; the like varieties of colours I observed respectively to have arisen on different infusions of the *Lapis Hibernicus*, variously diluted, until on further dilution it struck only an amber-colour. Hence such diversity of colours as here specified, yielded by Galls in different Chalybeate waters, do not infer a different impregnating principle, but rather only different proportions of the same principle:

But

But to return to the tincturing articles; this water from *Brazil*, drew no tincture at all, from Rhubarb a dark olive-colour, from the blue Paper a green, from Syrup of Violets a russet-green.

The following experiments tend to shew the presence of Sulphur and Copper in this water.

Gold immersed twenty-four hours in it acquired a somewhat darker hue, Silver a lead-like colour, as did also Copper. In another experiment the Silver, besides the leaden, had also a copper-coloured hue, a *phenomenon* frequent in the sulphureous waters.

An intense Cold had the same effect as an intense Heat, to be hereafter mentioned, in separating the Sulphur from the water; for when this water had been frozen in a bottle, and was spill'd about the room, it stunk greatly.

The blades of Knives immersed in it, acquired besides a rustiness, an intermixture of red streaks, as from Copper.

The specific Gravity of this water compared to that of distilled water appeared by the Hydrometre to be as $5\frac{1}{2}$ to 4. 0.

The Analysis.

THE brown colour of this water agreeing well to that of a solution of *English* Vitriol in water, is plainly owing to the Ochre which it lets fall on being kept ten days.

Being set over the fire to evaporate, as soon as it began to simmer, it threw up a brown Ochre-like Scum, and there ensued a precipitation of a yellow Ochre, and the upper part of the liquor became limpid, and it emitted a vapor of a strong disagreeable smell, an argument of Sulphur.

A gallon of the water evaporated by a mild heat, yielded 170 grains of *Residuum*, of a brown-reddish, with an intermixture of a greenish colour, of an acid and austere taste, and which fermented strongly with

with solution of Salt of Tartar and Spirit of Hartshorn.

The Salt separated from the other parts, was of a fusc and greenish colour, and smell'd very strong, somewhat like Melilot, on drying, and is of the same acid and austere taste as the water :

It made a strong ebullition both with solution of Salt of Tartar and Spirit of Hartshorn ; and moreover, even the solution of the Salt in distilled water made a strong ebullition with Spirit of Sal Ammoniac prepared with Salt of Tartar, (and withal exhibited a brown ochreous sediment), an argument of a great degree of acidity in this Salt ; and the following experiments concur in giving the same evidence, viz.

The same solution turned purple with the blue Paper, and reddish with Syrup of Violets ; it was clear with Lime-water, exhibiting only a very small brown sediment ; Vinegar and Oil of Vitriol made no change with it.

The same solution was of a deep blue with Galls, and Tormentil-root, green with Sumach and green Tea, and of a dark-green on standing with the leaves of Bramble.

The blade of a Knife immersed in this solution acquired an intermixture of high-red Copper-coloured streaks, besides the rustiness, and Silver immersed in it, became yellowish, experiments further confirming the presence of Copper and Sulphur in this water.

The Salt in Substance smoaks and stinks on the red hot iron, and turns red thereon, and still retains the acerb and vitriolic taste. It moistened in the air. I found by a cold infusion of many days, and then boiling half an hour in *Balneo Mariae*, it was dissoluble in sixteen times its own weight of distilled water, which is nearly the proportion of water that Alum requires to dissolve it, whereas the Vitriols are dissolved in a much smaller proportion : now when to this experiment one adds the taste of the water, viz. resembling

Lemery
cited in
Vol. 6. of
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a mixture of Vitriol and Alum, and that indeed such a mixture is actually found frequently to occur in pyritical bodies, and moreover that more or less Alum is found by some late observations to enter into the very composition both of the green and white Vitriol, it seems at least not improbable, that, altho' the predominant salt be undoubtedly Vitriolic, here may be some admixture of Alum with it.

Lastly, the *terrestrial matter* separated from the saline, was of a brown reddish colour, and in weight about one-fifth part of the Salt. It fermented not either with Acids or Alcalies; on calcination it turned to a dark red.

Corol. The predominating principle impregnating *Curragh duy* water is a martial Vitriol, in a comparatively large proportion, and of a great degree of acidity, to which is joyned a gross Sulphur, a little Copper, and probably a little Alum.

N. B. A cold infusion of the *Lapis Hibernicus* for twenty-four hours in the proportion of four ounces to a pint of river-water, agrees so exactly to the above examined water both in taste, in the appearances with Acids and Alcalies, with Milk, with Galls, with the Metals, and in short, in almost every experiment, that I take it to be no rashness to affirm, that this water is a solution of such a mineral in the bowels of the Earth; and perhaps the same thing might be affirmed also of most of the other waters of this Class. For a more minute account of these experiments, and the inferences from them, I refer to the Chapter of Vitriol in my general History, where also is shewn, that the *Lapis Hibernicus* has, beside the martial principle, a small admixture of Copper; and that the Salt impregnating this water is not a pure *Sal Martis*, (tho' indeed this be the predominant one) is evident from hence, that several of the appearances above described

do

do not agree to a pure *Sal Martis*, but rather to a solution of venereal Vitriol, *viz.*

1. Both the water and the solution of its Salt exhibited an intermixture of a copper-like redness on the blades of Knives immersed in them.

2. The water turned green with several of the austeres, as Tormantil-root, Sumach, &c. with which the solution of pure *Sal Martis* does not turn green, but black; whereas the solution of blue Vitriol turns green with them.

3. The water also turns green with Vinegar; and lastly, its appearance with Lime-water is also more agreeable to a solution of the venereal than of the martial Vitriol. However, that here is but a very small proportion of the first appears from the water's wanting the abominable nauseous taste which even a small quantity of the venereal Vitriol would give it.

The premises may abundantly suffice, to lead us to give some rational account of the Operation and Virtues of this water, as far as chance has yet discovered them, and give hints from analogy for its further application in the hands of the sagacious.

And 1. externally, it is a powerful Styptic, and has been, as I am informed, used successfully in Hæmorrhages of the nose; and the *Aqua Herpetica Batiana* whose basis is white Vitriol and Alum, gives encouragement to apply it, *præmissis præmittendis*, in Herpes's and other diseases of the Skin, as does the known efficacy of the several other waters of this Class in the cure of old dyssepulotic Ulcers (the reproach of physick and surgery) to try it also in these cases, and in inflammations of the Eyes; and the addition of Sulphur and Copper to the martial Vitriol in this water, must improve its virtues in such cases.

2. Tho' the great acrimony of this water might seem wholly to discourage the *internal use* of it, yet there are not wanting instances of its good effects used in this manner; and first, its *operation* is like that

of the other waters of this Class above mentioned, viz. it commonly purges and vomits pretty smartly; I have indeed been informed of some who have taken two quarts of it without being vomited, but I have known ten ounces of it to have produced sickness and vomiting and nine stools with gripes.

I have been assured, that a plentiful discharge of Worms hath been observed to ensue on taking it inwardly; and indeed, that it must be a powerful Anthelmintick is obvious from the Analysis.

The common people in the neighbourhood take it in Agues with success, sometimes to the dose of three pints, which purges them upwards and downwards; moreover there are also instances of Jaundices and Dropsies that have given way to it; and here it may not be impertinent to observe, that even Poisons, and those medicines which in larger doses prove violently emetic and cathartic, are by the sagacity of the physician, being given in smaller doses, and properly diluted, (as this water also in some cases would require) converted into Sudorificks, Diureticks and Alteratives: thus the tincture of even pure Copper prepared with Spirit of *Sal Ammoniac* or of *Sal Volatile*, given in a very small quantity, sometimes acts powerfully by sweat and urine, and prevails in many chronical diseases, particularly in the Worms, Dropsy, *Pituita frigida*, and all diseases thereon depending; and as this water contains a small proportion of Copper united to the other principles, it may prove not wholly useless to annex the following testimony of the powerful effects of such a medicine taken in small doses, as a hint capable of improvement.

See Boer-
haave's
Chemic.

Rieger In-
trod. ad
notit. rer.
nat. sub
articulo
as.

“ Si granum Vitrioli veneris diluatur aqua viginti unciis, & tunc detur omni mane unica, erit effectus mirabilis in morbis chronicis, sine vomitu, & sic plane innoxium factum medicamentum.”

The

S E C T. V.

The Acid Water at KILBREW.

OF all the Vitriolic waters I have met with in *Ireland*, the strongest is that impregnated by a certain black vitriolic minera in a park of *Richard Gorges, Esq;* at *Kilbrew*, about a mile from *Ratoath* in the county of *Meath*, first taken notice of in the year 1744. of the black Earth impregnating which I have given a minute account in the Chapter of Vitriol in my general History.

In the neighbourhood is plenty of yellow Ochre, and a great appearance of Iron-mine

The following examination was chiefly of the rain-water and land-drains received into little hollows near the said black Earth, and strongly impregnated with the soluble parts thereof, so as to become of an amber colour, of a vehemently acid and corrugating taste, incomparably stronger than the last described water near *Nobber*, being truly caustic, especially where the water was most strongly impregnated, it being of different degrees of strength in different spots.

The high degree of its acidity appears not only from its precipitating gross ochreous and greenish clouds, with solution of Salt of Tartar and Spirit of *Sal Ammoniac*, but plainly fermenting with both these Alkalies, which it is rare to find a water so far sated with acid as to do, as *Sbadwell, Haigh* in *Lancashire*, and this water.

It neither lathered nor curdled with Soap. It loses the amber-tincture, and grows clear with Oil of Vitriol, and with solution of Alum, and with Lime-water.

It exhibited a small brown grumescence with solution of Silver; with solution of Sugar of Lead a white sediment.

It coagulated Milk, even cold ; it also strongly coagulated *Albumen Ovi* and *Saliva*, and turned them both brown.

It blackens the teeth exceedingly, as also the stools of those who drink it ; yet Mutton boiled white in it.

It strikes of an intense blue with Galls, but extracts little or no tincture from Logwood.

A polished Knife immersed in it some minutes receives a blue colour, together with deep copper-coloured streaks, giving suspicion of an admixture of Copper, as the lead colour Silver acquires in it (as Copper does also in some degree) shews Sulphur.

The Analysis.

It carries a light bluish Scum on its surface : it grows fetid on keeping.

The specific Gravity appeared by the Hydrometre to be various, according to the different spots it was taken from, so that in some trials, it was as heavy as sea-water, whilst in others, it did not exceed the Gravity of rain-water ; hence I doubt whether we have any certain standard for the degree of impregnation, which however the Hydrometre would help to to determine.

One pint drawn off from three of this water by a retort and receiver, gave no indication of any thing either acid or vitriolic, either by the taste, or by the tincture with Galls.

Exhaled to a dryness, it yielded a very large proportion of contents, viz. in one specimen, a gallon left above three ounces, viz. 1675 grains, in another, it left 1168 grains of *residuum*, in a third sample examined in *September* 1750. I got 1696 grains from a gallon, so that at a medium, a gallon holds 1530 grains, viz. above three ounces, and consequently, it is somewhat stronger than *Shadwell* water.

January

January 7, 1750. A pint yielded 264 grains of sediment, viz. 2112 grains to a gallon, being much the largest proportion I yet had got from any water of this kind.

This *residuum* is partly brown, but green in the upper parts of the pan, of a strong acid smell, and partly like that of Melilot-plaister, of an acid and highly acerb taste: it contains above thirteen times the proportion of Salt to the indissoluble parts.

Syrup of Violets turned this *residuum* in one experiment of a brown reddish colour.

The same *residuum* on the red hot iron melted in blisters, and was left thereon very green.

The Salt separated from the other parts liquifies in the air, curdles milk even cold, and ferments strongly both with solution of Salt of Tartar and Spirit of Salt Ammoniac, so that it is a stronger acid than the Salt of several of the preceding waters, and even than Copperas, being indeed truly caustic; for a piece of mutton being boiled with this Salt, was perfectly corroded and rotten, and did not turn red, but brown.

A solution of twenty-eight grains of it in two ounces of distilled water, did presently coagulate *Sativa* and *Albumen Ovi*: it fermented with solution of Salt of Tartar: it stained a Deal-board black: it retained its amber tincture with solution of Copperas, and grew clearer with solution of Alum.

On evaporation, this solution threw down its Ochre, and the Salt on the bottom and sides of the vessel was partly black and brown, and partly white and like hairs, or a capillary white Vitriol, as it undoubtedly is, having all the marks of an highly acid, martial Vitriol, and accordingly the substance melted in large blisters on the red hot iron; but it is of a more difficult solution than Copperas, for half a dram in two ounces and a quartar of distilled water were scarce entirely dissolved, but left $1\frac{1}{2}$ grains of undissolved matter in the filtre.

Moreover, I infused two pounds of the above mentioned black Earth impregnating this water in a gallon of water, filtered and evaporated very low down, viz. to five drams only, and then set to crystallize, whereby I obtained fair green crystals of Copperas, as appeared both to the eye and taste, and by the black tincture they yielded with Galls.

The solution of the Salt set by and examined after eight months, and a little stalk of a plant put in it, exhibited on the stalk fair green Crystals, partly pyramidal, and partly rhomboidal, such as common Copperas, alike circumstanced, ordinarily forms, as *Henry Barton*, an experienced and judicious operator on these subjects, to whom I shewed these crystals, affirms.

Corol. *Kilbrew-water* is strongly saturated with a very acid martial Vitriol, partly white, and partly green, not without an admixture of Copper and Sulphur; and if we allow Alum to enter into the composition of all Vitriols, a little Alum must also be added, tho' that the martial Vitriol is the predominant Salt abundantly appears from the foregoing account.

As to the *Operation* and *Virtues* of this water; altho' from its prodigious acrimony one would readily condemn all internal use of it, and that I am informed of a person, who by taking half a pint of it fell into Convulsions (which however ceased upon the use of medicines) yet divers empirical tryals have been made of it both in external and internal use, which may be of service to the sagacious physician as hints for further improvements, by varying the dose, by diluting with common water, softening it by making a posset with milk, &c.

And 1st, as to its *external use*, *Richard Gorges Esq;* the Proprietor of the Ground, observed that his horses were cured of the Mange by treading on, and rolling themselves in the water and earth above mentioned, and it has since been found effectual in the

cure

cure of the Mange in hounds as well as horses: It dries up sharp running humours both in man and beast, heals serpiginous Ulcers and Pustules of various kinds, for which purposes it is not only applied externally, but also drank sometimes to the quantity of a quart, which purges, and withal, sometimes vomits severely; and I have been informed, that a cap made of the Earth and worn has cured a scald head, wherein it probably acts as an Escharotic and like the *Turkish Rufma*, as is observed in the Chapter of Vitriol in my general History.

These instances are well attested, and yet I confess, even the external use of this water in some stubborn Ulcers was not with me attended with equal success, but with such pain in the application, that we were forced to desist from its further use, which whether owing to impatience of the sick or to the excessive acrimony of the Vitriolic salts, and their want of proper dilution, (even as Vitriol and Alum are wash'd and burnt in order for their safer use) or both, I cannot say, tho' I know it has in another instance effectually healed an Ulcer in the leg of several months standing, by washing and applying linen rags dipt in the water; and these virtues and good effects are perfectly agreeable to those described of the Vitriolic ores in the Chapter of Vitriol in my general History, viz. as endued with a powerful drying, repelling virtue, astringent, absterfive and moderately escharotic, and as such cleansing and healing putrid and malignant Ulcers.

They also agree very nearly to the virtues of *Shadwell*, another strong Vitriolic-water, much like this both in its constituent parts, and in its effects both externally and internally.

As to the *internal use*, tho' this be condemned as noxious to the Stomach and Lungs, there are not wanting instances, not only of its having been drank without prejudice, but even to advantage.

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The Operation is somewhat uncertain from the different strength of the waters: thus three persons by taking only four ounces of it were vomited and purged several times: others have taken half a pint in a day with the like Operation: another took a pint in a day for eighteen days, which vomited him and gave him about five stools in a day; and some have adventured to take a quart for a dose for some days, and afterwards a pint in a day for some weeks, but the operation upwards and downwards, proved very severe: and a smaller quantity of the stronger water is undoubtedly sufficient.

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Work.

A certain physician, my correspondent, gave it cautiously and prudently, viz. to the dose of a small wine glass of the weaker water, by degrees increasing this to a double quantity with an addition of the stronger water to each dose: this was taken morning and evening, and in a few cases of Uterine hæmorrhages, and the *Fluor albus*, this method proved successful, tho' it failed in some others; but he always observed it to restore lost Appetite.

I also met with an instance of an inveterate *Fluor albus*, which was lessened and the matter rendered clearer by taking a pint of it daily for a month; but a child who had breakings-out on the Skin, justly suspected to be venereal, and derived from its parents, was indeed cured of these by this water, but this was succeeded by a worse disease, viz. a terrible Cough, agreeably to what is observed in the medical Essays of the waters of *Moffat*, viz. that in Gleet, unless the venereal *virus* be first carried off, those waters as effectually pox the patient as any quack medicine, whence appears the necessity of taking proper advice in the use of such waters, tho' the giddy vulgar run to them in all cases, and doubtless, often to their prejudice.

In one who drank it, a discharge of Worms followed, as was observed also of the *Nobber-water*. It must
be

be owned, that some rebellious chronical diseases have given way to the empirical use of this water, particularly some Dropsies, which my Correspondent also confirms, and adds, that its good effects in Agues are more certain in the opinion of the vulgar, than that of the Bark, and that crowds of people resort to it for this purpose, and are seldom disappointed in their expectations.

I shall conclude with one instance of a Dropsy complicated with a Jaundice, wherein I was eye-witness to its considerable effects, viz.

John Powel, who had drank of various liquors freely, *A. D.* 1749, and in the 43d year of his age, fell into a confirmed Dropsy: the tumor of his belly was prodigious, his urine little and red, a thirst, inappetence, and Jaundice attended: he had a cadaverous face, was entirely emaciated in his limbs, and withal had watry blotches on his skin.

He had taken many medicines, and at length the *Aqua florum omnium*, all to little purpose: in this condition he went to *Kilbrew* in summer, and drank every day half a pint of the water, which in the beginning vomited and purged him violently: his vomitings bilious, and his stools black.

He continued the use of it four months, finding his appetite to increase on it, tho' the tumor still continued: he persisted in its use in the same dose in winter, but warmed the water and drank warm whey after it, to promote the operation, which continued moderate, viz. to about five stools in a day, and sometimes interposed the use of Rhubarb and other purges, and in 1749-50 had recovered his complexion and flesh in the emaciated parts, as also his appetite and strength, and the tumor of his Belly was vastly abated, tho' not quite gone, which probably may be owing to his own imprudence. The same person repeated the same water in 1750. and was still better, and 1751.
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was in a good state of health, and continued so even to the year 1756. altho' sometimes, upon any slight menaces of a relapse, he again used to have recourse to the water.

S E C T. VI.

The Aluminoso-Vitriolic Water of BALLYCASTLE.

THE following account is the result of an examination of a specimen of it transmitted to *Dublin* in *August* 1742. by *Hugh Boyde, Esq;* and of another sent by *Dr. Andrew Smith* of *Belfast*.

It springs out from the face of a mountain an hundred yards high from the sea-mark: the ground it runs down, is in some places tinged with an Ochre-colour, and in some other covered with a white slimy substance. Is not this of the same nature with the white gelly-like substance, called *Slame* deposited by the *Nevil-bolt* water upon stagnation? I procured some of it dried, but it did not betray any thing Aluminous or Acid, either by the taste, or by its fermentation with Alcalies.

Dr. Smith found near the spring, but a great deal lower, among the interstices of stones and strata of earth, some perfect native crystals of the Vitriol of Iron, agreeing to the *Vitriolum Anglicanum* in all experiments. He also sent me from the same place a second sort of native Vitriol of Iron, white and in the form of a powder, but more acid than the former, however, a meer martial Vitriol, whereof I have given a minute account in many experiments made on it in the Chapter of Vitriol in my general History: the same physician sent me from the same place, a specimen of a black slatey rock of a strong aluminous taste, and which seemed to him to resemble that described by *Rieger* under the article Alum, of which they prepare their Alum in *Sweden*, but when I examined

mined it here minutely, I found it to be no other than our *Lapis Hibernicus*, whose predominant salt is truly the martial Vitriol, tho' I shall not take upon me to deny the possibility of extracting Alum from it; and indeed as Alum-mine and the *Pyrites* yielding martial Vitriol are observed by our *English* writers to be commonly found united, I strongly suspect such a combination here, which will be further countenanced by the following examination of this water, which was made in *Dublin* nine days after its being sent from the spring.

It is limpid, of an acid and austere taste (but less intensely so than the vitriolic waters of *Kilbrew*, and the acid water near *Nobber* above described) resembling a weak solution of Alum with an infusion of the *Lapis Hibernicus*, and withal seemed to betray something brassy.

With Spirit of *Sal Ammoniac* and Oil of *Tartar per deliquium*, it did not exhibit either an ochreous or greenish precipitation, like the vitriolic waters, but a white grumous cloud and sediment, wherein it agrees to the *Nevil-bolt* water, and to the solution of Alum. It curdled with Soap. It was clear with solution of Alum. It caused a small subtile precipitation with Lime-water, a white grumous sediment with solution of Silver, a minute white sediment with solution of Sugar of Lead.

It continued very limpid with Spirit of Salt, and with Oil of Vitriol.

Milk boiled with equal parts of it was curdled, but not with a green whey: it had also some effect in coagulating the animal humours, viz. it coagulated the *Albumen Ovi* considerably, *Serum* very little, the *Saliva* a little.

Beef infused and boyled with it was not reddened.

The blade of a Knife immersed in it became of a shining copper-colour in several experiments, but Silver suffered no change of colour.

The

The Vitriolic quality in this water is so far from being predominant, that it had not tinged the Corks black; and with Galls it only struck a dilute and fading blue, and in some bottles sent me at another time, one bottle struck not blue, but green with Galls, and two others a pale blue, tho' it was plain in another experiment, that its Vitriol was so far from being volatile, that it struck with Galls after having been kept in an open vessel eight days; with Sumach it exhibited a greenish colour.

With Logwood peculiarly it strikes a bright red, which on standing becomes crimson; whereas from the other tincturing articles, it extracts very little, *v. g.* from Rhubarb only a pale yellow, from Brazil a very pale red, from Ash-bark no blueness at all, nor any greenness from Syrup of Violets, but with the last keeps the blue colour, all evidences not of Nitre, but of a Salt resembling Alum, and the Salt of *Nevil-bolt-water*.

The Analysis.

1. *Spontaneous.* Notice has already been taken of the Ochre which this spring deposits in its course: it also when transported to *Dublin* deposited spontaneously a small quantity of Ochre, which being calcined, became as red as *Minium*, and was partly attracted by the Magnet. It has also been observed, that it deposits a white kind of slimy substance like what the Alcalies precipitate from it.

2. *Artificial.* In evaporating this water, there were distinctly seen three differently coloured substances. 1. There was an Ochre floating in the water, which, as most ponderous, by and by subsided to the bottom. 2. Above this was a green circle as of *Vitriolum martis*. 3. Below this was a white matter, which had the taste of Alum.

When this water was evaporated to about $\frac{1}{3}$, it scarce struck blue at all with Galls, but it still struck
a deep

a deep red with Logwood and precipitated a gross white grume with Oil of Tartar *per deliquium* arguments of Allum: moreover, the decoction of gr. 46 of the *residuum* of this water boyled in a pint and half of distilled water to a pint, and filtered, struck crimson with Logwood, and deeply so when evaporated lower down, and gave a red purplish colour with blue Paper, which agrees to Alum, or at least to a predominance of Alum, and not to martial Vitriol, which does not give the crimson-colour with Logwood, and moreover, the above decoction gave but a very faint blue with Galls.

This, by the by, agrees to the use the vulgar make of some wells in the *North*, called *Aluminous*, which they use with success in dying the same colours as Alum does.

A gallon of this water yielded in one experiment sixty grains, in another forty-eight of *residuum* of a pale whitish-brown colour, of an acid, rough and sweet taste like Alum combined with a little Vitriol, and withal it had actually a urinous smell, such as was also observed in evaporating the *Nevil-bolt*-water. It caused no ebullition with Acids, nor with Alcalies. It turned greenish with Syrup of Violets:

Mixed with *Serum Sanguinis* did not sensibly coagulate it, as neither did the water when evaporated low down.

The Salt separated from the other parts, is of a brown and white colour, of an aluminous and vitriolic taste, and being now disengaged from the terrestrial matter shews its acidity more apparently by making a conspicuous ebullition with Spirit of *Sal Ammoniac*, tho' not with Oil of Tartar: it also curdled Milk, even in the small proportion of two grains to an ounce of Milk, exhibiting a clear whey, an argument of greater acidity in this than the ordinary Nitre of the purging waters; and moreover, being mixed with blood flowing from the veins, it produced
a size

a size when there was none in the unmixt blood flowing from the same veins: to this add, that on the red hot iron it rose in blisters, and that being rubbed with Salt of Tartar, it emits a strongly pungent smell even as Alum does. Nevertheless, that this Salt is not without a mixture of martial Vitriol is evident from hence, that a strong solution of it struck a pretty deep blue with Galls.

The *terrestrial* or rather *indissoluble* matter separated from the saline, made no ebullition with Acids nor Alkalies; it sparkled much, and stunk on the red hot iron, and acquired somewhat of a reddish colour by a calcination of two hours, and was attracted by the Magnet.

Corol. 1. In order to the conviction of those who deny the existence of a native Alum, I shall sum up the evidences of the predominance of such a salt in this water, *viz.* this appears from the white substance deposited by this water both spontaneously, and by evaporation, as from a solution of Alum, and not from a meer solution of martial Vitriol, by the result of the admixture of Alkalies, joined to the taste of the water and its *residuum*, its clearness with solution of Alum and with Acids, the crimson-colour struck with Logwood both by the water and by the solution of its Salt, the equally strong or stronger coagulating quality of this water, with respect to the animal humours than of *Nevil-bolt-water*, tho' containing a far less proportion of salt, and the solution reddening with the blue Paper, and the urinous smell of the *residuum* both spontaneously and on the admixture of Salt of Tartar, which several appearances joined together shew a salt at least strongly resembling Alum, and entirely different from martial Vitriol, tho' that here is also a combination of this is abundantly evident, and withal probably some mixture of Copper.

2. *Ballycastle*

2. *Ballycastle*-water agrees to that of *Nevil-bolt* in being impregnated with a salt resembling Alum, but *Ballycastle* has a notable proportion of Vitriol, which is not essential to *Nevil-bolt*-water, and probably some Copper, which it does not appear that *Nevil-bolt*-water has; but *Ballycastle*-water has no calcarious Nitre mixed with its Alum, whereas *Nevil-bolt*-water has a large proportion of calcarious Nitre, and therefore is not only astringent, but purgative at the same time; whereas the *Ballycastle*-water is not, by the *Analysis*, entitled to any share of a purging quality; but, tho' I am not yet informed of any medicinal uses this water has been applied to, it must undoubtedly be a more powerful bracer, corroborator, styptick, drier, and repellent, *cæteris paribus*, than the merely Chalybeate, and than the merely Vitriolic waters equally impregnated, and as such I recommend it to trial, not only as a powerful drier and repellent in external cases, but internally where a greater constriction of the solids, and a greater tenacity in the fluids is wanted, and consequently in excessive discharges either of the blood or other humors, as a probable suitable medicine, whether as a vehicle to other remedies, or as a principal medicine, *præmissis præmittendis*: and as it will bear carriage to remote places, retaining its original qualities, it may be of use not only on the spot, but in other parts of the kingdom far distant.

Since the above was written, Dr. *Smith* informs me that he used it with success in a violent uterine Hæmorrhage, tho' only as an auxiliary medicine in conjunction with other powerful astringents, &c.

S E C T. VII.

The Acid Copper-water of BALLYMURTOGH

IS a water issuing out of a Copper-mine at *Ballymurtozh* in the county of *Wicklow*, formerly wrought

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Philosoph. as such, tho' for some years past, viz. (before the
 Transact. year 1752) it has been disused; it is situated on the
 Vol. 47. South-bank of the river *Arklow*, and about half a mile
 from *Newbridge*.

This water, as well as that of the following Section, which is near it, is famous for an operation which is called turning Iron into Copper, like those of *Ciment* and others in *Hungary*, of which elsewhere, tho' the supposed transmutation is no other than a dissolution of the Iron bodies immersed in this acid-water as attracting the particles of Iron more strongly than those of Copper, which are therefore precipitated and deposited in the room of the Iron, an appearance similar to what happens on the rubbing the blade of a Knife with Roman Vitriol, and like what I have seen in a very short time effected by immersing plates of Iron in a solution of Copper in *Aqua fortis* diluted, which became masses of entire Copper to the very centre, and of the same shape as the Iron was before: and the like changes are also effected in divers petrifications of shells, wood, &c. and a large Iron shovel accidentally left in this water was shewn in *Dublin*, transformed to Copper, as it is said, to the very centre.

This method however of getting Copper from this water by immersing bars of Iron in it has been here practised to great advantage, as the Copper is hereby separated and precipitated almost pure, and the expence of fuel for smelting Copper in the ordinary way in a great measure saved.

John Champion, a person very conversant in these subjects, sent me a specimen of this water, *October 22*, 1746. who observed in the neighbourhood of this spring, 1. A Rock of Iron-stones. 2. The *Pyrites aureus*. 3. A thin stratum of Copper-ore.

The water was yellowish at the fountain, limpid on its arrival in *Dublin*, inodorous, of an acid, austere, ferruginous and somewhat brassy taste, and nauseous in the throat.

The

The Hydrometre stood in it at 5. 0. when in distilled water it stood at 7 $\frac{1}{2}$.

The Alcalies and Lime-water were the chief precipitators of the contents of this water; Soap was not dissolved by it, but formed small curds. Solution of Salt of Tartar exhibited a grumous subsidence partly white, partly ochreous, and partly green: Spirit of *Sal Ammoniac* gave a sediment like the preceding, which by and by became blue. The solution of Silver turned it of a bluish white; and the solution of Sugar of Lead exhibited some small ochreous subsidence.

The solution of Alum continued very clear with it, as also did the solution of Copperas.

It was also clear with Oil and Spirit of Vitriol: Vinegar turned it first greenish and then bluish.

Galls turned it of a deep blue: Sumach turned it blue, it had blackened the Cork in the bottle, as also a Deal-board, on which it was spill'd (evidences of a martial Vitriol) it turned of a deep Violet with Logwood, a pale crimson with Brazil, a deep green with Ash-bark, and an olive-colour with Syrup of Violets.

Boiled with milk, even in the small proportion of two drams to an ounce of the milk, it produced a stiff curd and clear whey: it also curdled *Albumen Ovi* and produced some opacity in the *Saliva*.

Beef boiled with it was not reddened.

The Analysis.

SILVER immersed in it suffered no discoloration, but a clean Knife continuing immersed in it an hour, became of a deep Copper-colour.

The water on standing grew a little wheyish, and precipitated some Ochre.

A quart of it exhaled to a pint, became very austere and acid, and exhaled to a total dryness left one dram and fifty-two grains, viz. nearly the proportion of an ounce of a sediment from a gallon, which was partly ochreous and partly of an obscure white, of an

acid smell, of an highly acid and austere vitriolic taste, fermented greatly with both the Alcalies, and yet turned green with Syrup of Violets. On burning on the red hot iron it smell'd somewhat like Melilot plaister.

The solution in distilled water whilst exhaling to a dryness, had also the last mentioned smell, and yielded a Salt partly of a brown yellowish, and partly of a dark-green colour, of the like taste and smell as the *residuum* in gross above described, and which also made a great ebullition with both the Alcalies and melted in blisters on the red hot iron.

My worthy Correspondent above named obtained fair green and bluish crystals, and a little white Vitriol from the solution.

The indissoluble matter left in the filtre was ochre-coloured, with some dark-coloured spots interposed, and bore but a small proportion, *viz.* one grain to sixty of the saline parts. It sparkled on the red hot iron, and turned red there, and then yielded greatly to the Magnet. It made no ebullition with Spirit of Vitriol.

Corol. 1. *Ballymurtoogh*-water is an highly acid one, impregnated with the Vitriol of Copper and Iron.

2. I have as yet heard nothing of its use, but externally in the cure of sore eyes, in which case, from its principles it must undoubtedly be very proper, and might be applied to divers other uses agreeable to its composition of the two aforesaid Vitriols, whose operation and virtues are elsewhere described; and moreover, as this water contains a greater proportion of Copper than most or any of the vitriolic waters, whose histories I have given above, it must undoubtedly have a more powerful operation as an astringent, drier and escharotic.

S E C T. VIII.

The Acid Copper-water of CRONE-BAWN.

COMES also from a Copper-mine in the neighbourhood of the former, but much richer, according to Dr. *William Henry*, who has given an account of it in the 47 and 48th Volumes of the *Philosophical Transactions*, and is now (*A. D. 1755*) wrought, being situated on the *North* side of the same river called *Arklow*, and about seven miles from the town of the same name, two miles S. W. from *Redcross*, and thirty-eight miles from *Dublin*.

The water is sometimes green, and in rainy weather it appears like a solution of Verdigrease, but sometimes it is limpid, and what was transmitted to me in *Dublin*, was brownish, and of an acid austere, somewhat inky, and withal nauseous taste, such as is proper to a solution of the cupreous Vitriol, and of a strong smell. The Hydrometre stood in it at 2. 0. when in distilled water equally exposed it stood at 3 $\frac{1}{2}$.

The waste water which runs from hence and mixes with the river at some distance kills the fish.

This water is also famous for what is called turning Iron into Copper, which is done to great advantage here, a Reservoir and Pits being made for the reception of the water, and bars of soft Iron placed in them, which contract a Copper rust, and by degrees the Iron bars are entirely dissolved and consumed, viz. in the space of three, six, eight or twelve months, sooner or later according to their thickness; and it is said that fifty Tons of pure Copper have been produced from the water in a year.

The Copper-rust falls from the bars of Iron to the bottoms of the pits, and to hasten the work, the bars are sometimes taken up, and the rust rubbed off.

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Transact.
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The Copper-rust fallen to the bottom of the pits in the form of a reddish mud is thrown up in a heap, and as soon as it is dry becomes a reddish dust, which is smelted into Copper: one ton of Iron in bars produces a ton and nineteen hundred and half weight of Copper-mud or dust; and each ton of this mud produces when smelted, sixteen hundred weight of the purest Copper, which sells at ten pounds *per* ton more than the Copper which is made of the Ore.

The polished blade of a pair of Scissors, immersed in the water eight minutes, was tinged of a bright shining copper-colour.

Some small iron-nails put into this water were in four minutes covered with a copper-coloured substance, and the water had the same effect on Silver and Tin, but not on Gold, in Dr. Bond's experiments; with me Silver immersed was changed to a leaden colour. Dr. *Hugh Rose*, whose curiosity led him to visit this water on the spot, *A. D.* 1755. observes, that plates of Lead immersed in it were covered with a copper-coloured rust, and at the same time a whiteness was observable upon those plates, shewing that the Lead was reduced to a Ceruss by the acid of this water. An effect analogous to what happens on the immersion of the Iron-bars in the pits, from which the water is drawn, deposits a thick ochreous crust on the sides of the channel, being the dissolved Iron.

Thus the Iron absorbing the dissolving acid in this water, the Copper is precipitated; but it is observable, that altho' there be a series of pits in which the Iron-bars are placed, on which the water successively runs, yet that the whole quantity of Copper contained in the water, is not hereby precipitated, but some Copper still remains, even in what runs from the last Pits; but perhaps there are other precipitators of the Copper equally, if not more effectual than Iron, *viz.* the Alcalies and Lime-water: for

A Solution

A Solution of Pot-ashes depurated, and Spirit of *Sal Ammoniac* excited a little ebullition with this water, and with me precipitated yellow grumes; and with *Dr. Bond* the solution of an alkaline Salt raised a strong effervescence with the stream above the Pits, and precipitated a brown substance. Ibid. V. 48

But Lime-water appears to be both a cheaper, and an expeditious precipitator of the contained Copper: for *Dr. Hugh Rose* found that equal parts of Lime-water and *Crone-bawn* water being mixed, a green sediment was precipitated, which appeared to be Copper, because the upper part of this mixture, after this precipitation, from a green colour, became transparent, and being poured off, did no longer impart a copper-colour to Iron immersed in it.

The solution of sea-salt is another precipitator of the Copper in this water; for that solution being made in the proportion of an ounce of Salt to six ounces of water, precipitated from *Crone-bawn*-water a brown sediment, and the upper part of the mixture from green became transparent.

Acids on the contrary, instead of precipitating the dissolved mineral, effect a more compleat and intimate solution of it; for the water became transparent on mixing *Aqua-fortis* with it.

The animal fluids are coagulated by this water: for *Albumen Ovi* was curdled strongly by it, and so was Milk boiled with only a fourth part of its own measure of the water, and even *Saliva* turned grumous with it.

Lastly, that in this as well as the foregoing water there is a combination of the martial with the venereal Vitriol appears by the trials with Galls, even with the water above the Pits, and I found it to tinge of a deep blue with Galls, and to have blackned the Cork in the bottle.

Logwood gave it a bright olive-colour.

The Analysis.

A GALLON exhaled to dryness left two hundred fifty-six grains of sediment, which was green, of an highly acid, austere, nauseous and copperish taste. It fermented strongly both with Spirit of *Sal Ammoniac* and solution of Pot-ashes, turned of a deep green with Syrup of Violets, and melted in blisters on the red hot iron.

The solution of it in distilled water filtered, turned of a bright blue with Galls, blue with fresh-bruised Tormentil-root, and green with green Tea; and I am informed that Icicles of blue Vitriol have been observed on the roofs of some of the cavities here.

Corol. *Crone-bawn-water* is highly acid, and strongly saturated with a venereal and martial Vitriol.

Notwithstanding the forbidding appearances afforded by this water with regard to its Use, especially as an internal medicine, there are not wanting some instances of its good effects both in external and internal uses; for we are assured that the miners and others frequently drink it without any ill consequences, even to a pint or a pint and half, as I am informed, and it purges and vomits them severely, and is their specific in some cutaneous Eruptions, and Dr. *Bond* infers from the effects it has on some earth-worms that it might probably be a very powerful anthelmintic if cautiously given.

Philosoph.
Transact.
Vol. 48.

Ibid. and
Vol. 47.

Externally it cures all sores of the skin, and is an excellent detergent for scorbutic Ulcers, and has performed several remarkable cures of this kind joined with internal medicines.

It has also been used with success in the Scald-head, as it was also in a certain inveterate and stubborn Gonorrhæa by way of injection, but in both cases it was diluted.

In

In order for the more ready conception of the contents and operations of these waters in one view, as likewise for a summary comparison of our *Irish* Vitriolic waters with the foreign ones of the same kind, I shall here insert from my general History of Mineral waters, two Tables referring to that for a more minute account of the foreign waters.

Table II.

T A B L E II.

A Summary View of some of the principal Appearances

	Sensible qualities.	Alcalies.	Acids.	Milk, and other animal fluids.	Beef or mutton.
<i>Haigh, in Lancashire.</i>		Ferments.		A viscous coagulum with saliva,	
<i>Shadwell</i>	Amber-colour, strongly acid and austere.	Ferments & precipitates a large ochreous sediment.	Clearer.	A strong coagulum with milk, albumen ovi, and serum sanguinis, and some with saliva	Beef contracted, not red-dened.
<i>Swansey</i>	Clear: acid and alum-like.	An ochreous cloud and precipitation.	Blue with vinegar.	No coagulation of milk.	
<i>Wicklow</i>	Amber-colour, acid and austere.	A coagulation.		A strong curd with milk.	
<i>Cross, or Cross-town.</i>	Limpid: moderately acid and austere, fetid on keeping.	A yellow-greenish sediment.		A curd, and turbid whey with milk: a small coagulum with albumen ovi and saliva.	
<i>Coshmore</i>	Limpid: acid, sweet & austere.	A brown & yellow sediment, with a greenness.		An obscure curd with milk.	
<i>Nobber.</i>	Pale brown: very acid, austere & sweetish.	An ochreous precipitation.	Clear: green with vinegar.	Curdles milk and albumen ovi.	
<i>Cronebaun.</i>	Limpid, sometimes green; acid, austere, nauseous.	A fermentation and yellowish grumes	Clear.	Curdles milk and albumen ovi strongly.	

Exhibiting

yielded by the Acid Waters above, more minutely described.

Galls.	Logwood.	Metals im- mersed.	Quant. of Contents in a gallon	Quality of Contents.	Operation.
Inky.		Iron tinged of a copper- colour.	Gr. 1920.	White and green vitriol, sulphur, and some copper.	Emetic, ca- thartic and sty- ptic.
Blue and green.	Yellow and olive- coloured.	Silver turned leadен and copper-colour- ed: a knife rusty and blue.	Gr. 1320.	Martial vi- triol and some sulphur.	Emetic, ca- thartic, astrin- gent, repellent, and somewhat escharotic.
Blue.		Silver of a leadен hue: a knife rusty & copper-colour-	Gr. 40.	Martial vi- triol, some sulphur and a little copper.	Styptic.
Blue.				Martial vi- triol and some sulphur.	Cathartic, re- pellent and heal- ing.
Blue.		No discolor- ation of sil- ver or iron.	Gr. 40.	White vi- triol.	Emetic, cathar- tic, diuretic and astringent,
Blue.	Reddish.		Gr. 48.	Vitriol green and white.	Emetic.
Blue.		Silver lead- coloured and copper colour- ed: iron cop- per-coloured streaks.	Gr. 170.	Martial vi- triol, and a lit- tle copper and sulphur.	Emetic, cathar- tic, astringent.
Deep blue.	A bright olive colour	Iron incrusted with copper: Silver of a leadен hue.	Gr. 155.	A venereal and martial vi- triol.	Emetic, cathar- tic, detergent and healing.

T A B L E II.

Exhibiting a View of some of the principal Appearances

	Sensible qualities.	Alcalies.	Acids.	Milk, and other animal fluids.	Beef or mutton.
<i>Kilbrew</i>	Vehemently acid, and almost caustic.	A fermentation, and ochreous and greenish clouds.	Clear.	Curdled milk, even cold, and strongly albumen ovi and saliva.	Mutton boiled white.
<i>Bally-murtogh</i>	Yellowish : acid, austere, brassy.	A white, ochreous and greenish sediment, & some blueness with spirit of <i>Sal Ammoniac</i> .	Clear.	A strong coagulum with milk and albumen ovi, and some opacity on saliva.	Beef not reddened.
<i>Nevil-bolt.</i>	Limpid: austere, bitter; sweetish, sub-acid.	A white sediment.	Clear.	Curdled milk; and moderately albumen ovi, and serum sanguinis.	Beef red, in one specimen.
<i>Bally-castle.</i>	Limpid: acid and austere.	A white grumous sediment	Clear.	A coagulum on milk, and some on albumen ovi and serum sanguinis, and a little on saliva.	Beef not reddened.
<i>Aqua Olonicensis in Russia.</i>	Limpid, slightly ferruginous and vitriolic.	No ebullition.	Clear.		
<i>Aquæ de Vablis in Dauphiny.</i>	Acid and austere, vitriolic.	Green.			
<i>Aqua Neosolionensis.</i>	Greenish, astringent, acid.				

Continued.

yielded by the Acid Waters, above more minutely described,

Galls.	Logwood.	Metals im- mersed.	Quant. of Contents in a gallon	Quality of Contents.	Operation.
Deep blue.	Little or no tincture.	Silver of a leadén hue: a polish'd knife copper colour- ed streaks.	Gr. 1530.	Martial vi- triol, some sulphur and copper.	Emetic, cathar- tic, drying, heal- ing, absterfive & escharotic.
Deep blue.		A knife ac- quired a deep copper-colour.	Gr. 480.	Vitriol of iron and cop- per.	Repellent, dry- ing, &c.
Bluish leadén co- lour.	Deep crim- son.		Gr. 584.	Calcarious nitre, alum, and a little vi- triol.	Cathartic and astringent.
A weak blue.	Crimson.	Silver not changed: a knife of a shi- ning copper- colour.	Gr. 54.	Alum, mar- tial vitriol, and a little copper.	
Very black.			Gr. 60. nearly.	A little sul- phur and acid spirit, iron and a vitriolic salt.	Eccoprotic, di- uretic, astringent, deobstruent.
Black in- clining to blue.	Red with Tournsol (Logwood not tried.)		Gr. 60.	Martial, white vitriol.	Emetic and ca- thartic.
			Gr. 310.		Emetic, cathar- tic, repellent, es- charotic.

T A B L E III.

A Comparison of some principal Appearances yielded by

	Alcalies.	Milk, and other animal fluids.	Galls.	Logwood.
<i>Westwood.</i>				
<i>Shadwell.</i>	A fermenta- tion.	Curdled milk, even cold.	Blue.	Yellow and olive-colour'd.
<i>Swansey.</i>	A fermenta- tion.		Pale blue.	* Blue.
<i>Crofs.</i>	A fermenta- tion with soluti- on of salt of tar- tar, tho' not con- stant.	Curdled milk.		
<i>Cosmore.</i>	A fermenta- tion, with salt of tartar, but not with spirit of <i>Sal</i> <i>Ammoniac.</i>	Curdled milk.	Blue.	
<i>Nobber.</i>	A strong fer- mentation.		Deep blue.	
<i>Kilbrew.</i>	A strong fer- mentation.	A coagulation of saliva and al- bumen ovi.	Black.	
<i>Nevil-bolt</i>	A fermenta- tion with spirit of <i>Sal Ammoni-</i> <i>ac,</i> but not con- stant.	Curdled milk, but not the other animal fluids so much as alum.	No purple or blue.	Deep crimlon.
<i>Ballycastle.</i>	A fermenta- tion with spirit of <i>Sal Ammon</i>	Curdled milk and blood.	A very faint blue.	Crimson.

Exhibiting

several of the Salts (and their Solutions) of the Acid Waters.

Syrup of Violets.	Blue Paper.	Figure of Crystals.
		Crystals of mature vitriol.
Red.		
	Red.	
Reddish.	Purple.	
		Fair green crystals of copperas from the impregnating earth: and from a solution of the salt.
Green.	Red.	Long crystals of calcarious nitre, and some of alum.
	Red purplish.	

OBSERVATIONS on the preceding
TABLES.

1. **T**HE existence of truly Acid waters is sufficiently established by the taste, by the coagulation, and sometimes even fermentation with Alcalies, by their clearness with Acids, by their curdling Milk, and lastly by the Salts of some of them turning red with Syrup of Violets and the blue Paper, tho' this last mentioned appearance is sometimes hindered by the combination of a ferruginous or terrestrial matter.

2. The existence of Vitriol in waters is also sufficiently established, by both the waters and their salts betraying most of the qualities of Vitriol chiefly the ferruginous, particularly in turning blue with Galls, and exhibiting frequently an ochreous and greenish sediment with Alcalies, and lastly by the figure of the Crystals.

3. With the martial Vitriol a little Copper is also frequently combined.

4. The real quantity of vitriolic matter naturally contained in each water is greater than in the Tables, as is shewn elsewhere.

5. The Operation of most of the Vitriolic-waters is pretty similar, *viz.* emetic, cathartic and astringent; to which may be added, *deobstruent*, from the good effects well attested in some Jaundices and Dropsies not curable by the common methods; and whosoever compares the principles as well as good effects of these waters with those of the tincture of Steel, and even of the weaker ferruginous waters in these cases, will find no great difficulty in admitting it.

6. Different Vitriolic waters differ greatly, both in the proportion of their impregnating Salt, and likewise in the different degrees of acrimony and acidity of their Salts, as by these Tables abundantly appears; and therefore they are to be prescribed in different doses,

doses, and require the prudence of the physician to adapt them to the weaker or stronger constitutions, whereas the giddy vulgar taking all at random, sometimes feel the fatal effects of their imprudence, and thus frequently the credit of many an useful water is destroyed.

7. The virtues of the Vitriolic waters are for the most part taken from empirical use, which the prudent physician will know how to apply to the advantage of his patients; in the mean time, inasmuch as the impregnating principles of these waters are now demonstrated, the younger physician may have recourse to the accounts given of the virtues of the sharp vitriolic Ores in the Chapter of Vitriol in my larger Work, those being the materials by which these waters are impregnated, from whence he will see that they may be applied to many purposes in medicine, besides those cases wherein they have been taken without advice, or any regard to preparation by bleeding, the use of proper diluents, and other auxiliary medicines joyned, &c.

8. The sharper of these waters contain a vitriolic Salt more strongly acid than the Vitriol of the shops, as is evident both from the taste of the waters, and from experiments on the Salt.

9. *Baccius* indeed, whom I have cited in my account of the virtues of these waters in the Chapter of Vitriol, seems wholly to condemn the internal use of them unless greatly diluted, or taken as a Vomit to expel poison, &c. So *Cæsalpinus* commends them in malignant and corrosive Ulcers, but in external use only: But *Tabernæmontanus* cited by *Baubine* in his treatise *de Aquis medicatis*, seems to have been a little more acquainted with the internal use of them, whose words I shall therefore here subjoin, partly as a corroboration of the foregoing accounts of the effects of these waters, and partly as giving hints for the

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further

further administration of them, tho' it is to be noted that he speaks of waters not strongly, but slightly impregnated with Vitriol, viz.

Vim habent adstringendi, contrahendi, extergendi, glutinandi, iisdem fere cum alumine præditæ facultatibus, sed efficacioribus, linguam enim magis contrahunt majoremq; habent acrimoniam: Eæ si bibantur vel in Balneo administrantur prosunt ad Suffusionem, Vertiginem, Epilepsiam, Paralyfim, Sputum Sanguinis, Hæmorrhagiam Uteri & Hæmorrhoidum; Nauseam & Vomitum compescunt: utiles Melancholicis, mente captis, insanis; tollunt Cachecticorum & Ictericorum fædos colores: Hepaticis opitulantur & quibus sudores fætidî molesti sunt: hircum alarum emendant.

Ex iis Bainum confert Ulceribus depascentibus, Cancris, Fistulis; mundant, extergent, glutinant. Scabiem malignam Elephantiasî similem omnemq; adeo Pforam, Scabiem ac Pruritus Balneo & Potu; Maculas, Serpiginem, partium obscænarum pruritus & putrida Ulcera lotionem frequenti curant.

B O O K IV.
O F
W A T E R S
Impregnated with the Native
A L C A L I or N A T R O N.

IN my general History of Mineral waters I have shewn at large, that in some waters the predominating mineral is a native alkaline Salt. And

In my searches after the waters of this country, I have found many wherein the native Alkali is combined with Sulphur, as appears at large in the Book of Sulphureous waters.

I have also found the native alkaline Salt in several of those springs that are commonly reckoned pure waters, wherein, tho' it exists in so small a quantity as not to be sensible in the waters until the saline parts be concentrated by an evaporation of the aqueous, yet upon this the saline contents betray the qualities peculiar to alkaline Salts; and in three of our Sulphureous springs from the county of *Fermanagh* these saline parts so far predominate as to entitle the waters to the appellation of waters impregnated with Natron and Sulphur.

I have therefore reserved this book for an account of these waters; and in order to give a more general idea of them, and state their comparison with some of the foreign waters impregnated with the same kind of Salt, I shall give a short synoptic Table of some of the more notable of both from my general History.

S E C T. I.

TOBBER-BONY Water.

TOBBER-BONY, or *Tobber-bonach*, in *English*, the *well of Milk*, situate about four miles *North of Dublin*, is so called from its peculiar softness, being used in washing, and soon lathers with Soap.

It is a limpid water, without taste or smell, but before wind or rain has a little *fetor*, and probably more for its being covered, as it is at present by a barn built over it. It has plenty of air, as appeared by the rising of bubbles in a flask filled with it.

It exhibits only a subtile white cloud with the solution of Salt of Tartar, and a small sediment with solution of Sugar of Lead. It turned of a deep purple throughout with solution of Silver, but yielded little sediment.

With Oil of Vitriol and Spirit of Salt it made a minute ebullition.

With the tincturing articles the appearances were as follows: with Syrup of Violets it was green, with Logwood a deep red, with Rhubarb of an amber-colour, with Galls it exhibited a pale-blue circle descending lower on standing, and with Ash-bark a deep blue circle: all these tinctures are deeper than what our common hard waters extract from these articles, a concurring evidence, with others, of the alkaline quality of the impregnating Salt.

The Analysis.

DURING evaporation it exhibited, like the *Bristol* and *Mallow*-waters, a much greater whiteness on the sides of the pan, than our common hard waters do.

The Sediment left upon evaporation (which was about twenty grains from a gallon) was grey, and of a somewhat lixivial taste, and distilled water poured
on

on it acquired a lixivial and bitter taste. The same sediment fermented with Vinegar. It turned of a deep green with Syrup of Violets and emitted a pungent smell when rubbed with *Sal Ammoniac*. It does not suddenly moisten in the air as those of our ordinary hard waters commonly do, an argument of little or no marine Salt here.

It yielded about four grains of a yellowish Salt to three of indissoluble matter.

The Alcaline quality of this Salt separated from the indissoluble matter is abundantly manifest from the following appearances: It was of a weakly lixivial taste: It fermented with Spirit of Salt, and a solution of it made by pouring three ounces of distilled water on ten grains of the gross *residuum* exhaled to ten drams fermented with Oil of Vitriol, and turned instantly green with Syrup of Violets, and the Salt in substance turned presently of a bright green with the same Syrup; and half a dram of the sediment boiled in twelve ounces of distilled water to eight ounces and filtered, exhibited neither cloud nor *coagulum* with Oil of Tartar. The Salt in substance emitted a pungent smell when rubbed with *Sal Ammoniac*, and turned of an obscurely reddish hue with the solution of *Mercury sublimata* corrosive in water.

It burnt black and lay quiet on the red hot iron, but stunk.

Corol. *Tobber-lony-water* is impregnated with a small quantity of an alkaline Salt combined with a Calcareous matter and a pittance of Sulphur.

S E C T. II.

CARRICKMORE Water

WAS sent me by *Dean Richardson*, under the denomination of a weak sulphureous water, from *Carrickmore*, situate on the top of an high mountain

West from *Ballyconnel*, which is five miles from *Bel-turbet* in the county of *Cavan*.

It was filled in dry weather, *October* 18, 1743. and examined in *Dublin*, *October* 28. The spot the well issues from, is a soil inclining to Marl and Shells.

When first taken up, it was very cold, and of a soft milky taste like *Bristol-water*: when it arrived in *Dublin*, one bottle of it stunk, and had the flavour of a boiled egg, like the Sulphureous waters, but another bottle did not stink at all: on being agitated in the mouth it left some roughness on the palate, like several of the Calcarious waters.

It produced no discoloration in Silver immersed in it, nor did it exhibit any dark coloured cloud or sediment with solution of Silver, so that the sulphureous impregnation appears to be but weak.

It curdled strongly with Soap, tho' not with Milk. It exhibited a white sediment with solution of Salt of Tartar.

It made a very considerable ebullition with Oil of Vitriol.

It turned of a pale green all over with Syrup of Violets, exhibited with powder of Galls a bluish circle at the surface of the mixture, and a greenness near the surface with Sumach, an orange-colour with Rhubarb, a crimson fading to a deep red with Logwood, and a blue circle with Ash-bark, which grows pretty deep on standing.

These appearances with the tincturing articles are equivocal signs, common to the calcarious and to the alkaline Nitre; the fermentation with Oil of Vitriol is common to Lime-stone and an alkaline Salt. The curdling with Soap and Salt of Tartar shews calcarious Nitre; what further Combination here is, appears from the

The Analysis.

BEING exhaled to a dryness, (during which process, there appeared a great whiteness on the sides of the

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one
doal

the pan) it yielded the proportion of twenty-two grains of white sediment to a gallon, which was of a taste somewhat urinous, and rubbed with Syrup of Violets turned presently of a deep green colour, and with *Sal Ammoniac* smell'd pungent like Spirit of *Sal Ammoniac*, and being calcined, it turned of a deep red with the solution of Mercury sublimata corrosive, all evidences of an alkaline Salt.

Corol. *Carrickmore*-water is impregnated with calcarious Earth and Nitre, a native Alkali and a little Sulphur.

I do not find that this water has been used medicinally, save that one instance occurred of its being drank with good success in the Heart-burn, an effect perfectly agreeable to its impregnation with a calcarious matter, and an alkaline Salt.

See the account of *Bingham*-water among the warm waters in my larger Work, which seems to be much a like impregnated.

S E C T. III.

St. BARTHOLEMEW's Well

SITUATE two miles S. W. from the city of *Cork*, and vastly resorted to upon the festival day of the Saint whose name it bears, from a supposition of the great virtues of its water, seems to be considerably a kin to the foregoing water, with respect to the quality of the impregnating Salt, but with little or no mixture of calcarious Nitre.

It is a transparent and light water, and on the spot well tasted; but, though it was put into clean bottles, when it arrived in *Dublin*, it had not only deposited a considerable quality of whitish sediment, but was very fetid, and had the taste of eggs half rotten (*a*).

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So

(*a*) So the *Selters* water, and another of the same Class mentioned by *Hoffman*, *Capeclear*-water, our *Carrickmore* and *Glassenbury*, doal so readily putrify, from the Sulphur combined with their *Natron*.

So Silver immersed in the water on the spot acquired no discoloration, as neither did the solution of Sugar of Lead, nor that of *Englisch* Vitriol; but in the putrid state in which it was examined in *Dublin*, Silver immersed in it soon became tinged of a copper-colour, and next morning had a mixture of blackness with the copperish colour; and the solution of Silver exhibited an amber-coloured cloud and a tawny grumous sediment, as did also the solution of Sugar of Lead, and the solution of *Englisch* Vitriol turned it of a fine dilute sky-colour, appearances proper to Sulphureous waters.

It is a soft water, lathering smooth without curds with Soap both on the spot and in *Dublin*.

The comparative purity of this water further appeared from the solution of Alum continuing clear with it, and Spirit of Vitriol exhibiting little or no change with it either on the spot or in *Dublin*.

Syrup of Violets indeed gave it a dilute green, Galls gave little tincture, Logwood turned it a little sky-coloured above and olive below, an appearance that may be accounted for in the sequel.

The Analysis.

1. *Spontaneous.* It deposited an ash-coloured sediment, which being dried, flamed on the red hot iron, and excited a pungent smell when rubbed with Salt of Tartar, as it did also when rubbed with *Sal Ammoniac*.

2. *Artificial.* A gallon gave at a *medium*, in three different experiments twenty-four grains of sediment, ash-coloured, of a mildly pungent, bitterish and somewhat urinous taste. It made a minute ebullition with Spirit of Vitriol, soon turned of a deep green with Syrup of Violets, rubbed with *Sal Ammoniac* emitted a pungent and urinous smell, and rubbed with Salt of Tartar smell'd pungent, the characteristicks of *Natron*. It sparkled and emitted a suffocating smell on the red hot iron.

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The further Analysis by Putrefaction.

Dr. Tucky, a Coadjutor in the labours of the *Physico historical Society* in search of Mineral waters and other natural productions of this country, filled a jar with the water and mud of this well taken up *October 19*, and sent it to *Dublin*, where it was examined *February 21*, 1752.

A Silver six-pence which had lain immersed in it all this time was tinged of a black, yellowish, and bluish colour.

The mud was fetid, of a dusky reddish colour, of a consistence somewhat unctuous, and being dried, sparkled on the red iron, and smell'd but a little pungent when rubbed with *Sal Ammoniac*.

The putrid water had a scum on it like that on chalybeate-waters, and withal was of a ferruginous taste and strongly fetid, and the stink on exhaling it was almost intolerable, even more so than of any Sulphureous water I had ever examined; and moreover, Galls gave it a violet-purple colour, which next morning was like ink, and it held the colour several weeks.

Corol. Putrefaction extricates from *St. Bartholomew's* water both Sulphur and Iron, of which in the fresh water there are no tokens: the presence of the last named mineral is further confirmed by the partly sky-colour extracted from Logwood by the water above mentioned when it was moderately putrid, but not advanced to that degree of putrefaction as in this experiment.

Three pints and two ounces of this putrid water exhaled, left of a sad red and partly glissening sediment twenty grains, *viz.* near triple what the above moderately putrid water did, which sediment was fetid, and very acrid to the taste, and on the red hot iron stunk intolerably, and being rubbed with *Sal Ammoniac* smell'd fetid and pungent, as it did also when rubbed with Salt of Tartar.

Corol.

Corol. 2. Putrefaction attenuates and volatilizes the minerals, increases the quantity and acrimony of the alkaline Salt, and greatly exalts the sulphur.

It is little known in medicinal use, but among the superstitious vulgar, some of whom it is said however to have cured of blear Eyes, Dimness of Sight and even Blindness, Lameness, Contractions in the Sinews, &c. whether chiefly as a Lotion and cold Bath, or on account of the Minerals it contains, tho' in very small quantity as above, I leave to the determination of others; in the mean time, I query whether, whereas Putrefaction extricates and volatilizes the latent Sulphur and alkaline Salt to a great degree, the powers of the circulation in the human body, may not also exert some degree of efficacy in extricating and rendering those principles more active as a medicine when taken inwardly?

S E C T. IV.

CAPE CLEAR Water.

*Smith's
nat. and
civil Hist.
of the C.
of Cork.*

CAPE CLEAR Island is the most southern land in Ireland, being high and rocky, with a shallow soil and a slatey bottom, which has numbers of springs of soft water, lathering instantly with Soap; but the most remarkable is that of a fresh water Lough, situated towards the west-end of the Island, concerning which the inhabitants affirm, that if a cask in which train oil has been kept, be laid for a few days in it, it will be found sweet and clean. This is by some imputed to the small black worms which abound in this Lake, and are said to gather in great numbers on the cask fouled with oil and cleanse it by sucking the oil. However

This observation put me upon a chymical examination of the contents of this water, from whence I concluded it probable, that the nature of the impregnating Salt might have some share in this effect; for,
besides

besides their waters here being eminent for bleaching Linen-yarn, the Salt this water yields is of an alkaline nature.

The water on the spot is clear and well tasted, yet it will not keep, but stinks in a few days in a vessel kept cork'd. Of two bottles both carefully corked and rozined, transmitted to *Dublin*, one was, as on the spot, clear and well tasted, and without smell, but the second had a sulphureous smell, and a flavour like boiled eggs, as the Sulphureous waters: (a) and accordingly Silver immersed in the fetid water became of a fusc yellow colour on lying all night in it, and the solution of Silver added to the same water exhibited a yellowish grume and pale-brown sediment, and the solution of *English* Vitriol rendred the upper part of the mixture first dun, and then bluish: (b) but the solution of Silver with the sweet water exhibited only a small white sediment, tho' this on standing grew partly black like ink, and partly white, exhibiting far less tokens of Sulphur than the fetid water, to which agreed also the trials with Sugar of Lead.

This water both in its sweet and putrid state was found to be a little lighter than our common pipe-water.

It gave little or no tokens of calcarious Earth or Nitre; for it lathered smooth with Soap without curds both on the spot and on its arrival in *Dublin*, and was clear with Spirit of *Sal Ammoniac*, and exhibited only

(a) See a like disposition to putrify observed in other waters alike impregnated in the foregoing Section.

(b) These appearances are common to Sulphureous waters, so that this water contains, like that of the preceding section, a Sulphur extricated by Putrefaction, and, as it seems a grosser Sulphur than that of putrid Rain-water, Dew and most of the Chalybeate waters turned putrid, I have examined (except the *Dunse* and *Tralee* waters) which do not exhibit such discolorations with the metals immersed in them as the Sulphureous waters do.

the most subtile cloud imaginable with the depurated solution of Pot-ashes.

Syrup of Violets gave it a pale green colour, and Logwood a red.

The Analysis,

1. *Spontaneous.* Both the bottle containing the sweet water, and that containing the fetid, exhibited certain small bodies like thin leaves, (a) which when dried, were inflammable, as was also the spontaneous sediment of the fetid water, but with a white flame (an indication of something bituminous) and was of a brown colour and strong smell; it emitted no smell when rubbed with *Sal Ammoniac*, but a strong and penetrating one when rubbed with Salt of Tartar.

2. *Artificial.* A pint of the sweet bottle yielded four grains of an ash-coloured sediment, of a brackish taste and odd flavour, rubbed with *Sal Ammoniac* it excited a strong pungent smell, but with Salt of Tartar very little. It soon turned of a deep green with Syrup of Violets. It made a very little ebullition with Spirit of Vitriol.

It moistened in the air, and on the red hot iron sparkled and once crackled, arguments of *Sal marine* mixed with the *Natron*, or of a Salt like the *Egyptian Natron*.

The sediment yielded by the fetid bottle, was of a darker, *viz.* a snuff-colour: it was of a brackish taste, and like marine salt, fermented and emitted an acid fume with Oil of Vitriol: but the speedy change to a dark-green colour with Syrup of Violets, and the urinous smell it excited when rubbed with *Sal Ammoniac*, as well as the pungent and fetid smell it gave when rubbed with Salt of Tartar (*viz.* far stronger than the sediment from the sweet bottle) shew a *Natron* and Sulphur further extricated and rendred more sensible by Putrefaction, for it is observable that the sediment
before

(a) Compare a like account elsewhere of our *Swadlingbar* and other Sulphureous waters.

before Putrefaction only smells pungent and fetid when rubbed with *Sal Ammoniac*; but excites very little smell with Salt of Tartar before Putrefaction tho' a strong one after: in burning in the red hot crucible it emitted a blue flame.

Corol. *Cape Clear* water contains a native alkaline Salt or *Natron*, in small quantity, and, like the water of the preceding section, manifests a Sulphur also on Putrefaction.

This water is used by the inhabitants for dressing their victuals and washing, and as common drink: it has certainly a small quantity of a native alkaline Salt, or a Salt resembling the Nitre of the ancients well known for its saponaceous, abstersive quality, and tho' the quantity of impregnating Salt in the water of this Lake may be far less than in some others, as the *Lacus Ascanius* mentioned by *Aristotle* cited in the Notes in *Dalecampius's Pliny* in the Chapter of Nitre, whose waters are so nitrous as to cleanse cloaths immersed in them from spots and filth, (a) and the *Aque Kukussenses* mentioned in my larger Work, which dissolve Pitch, yet this water also may receive some degree of the same quality according to the quantity of the Salt contained.

S E C T. V.

Several other plain SPRINGS,

OR comparatively pure and soft waters, in my examination of the springs of the county of *Dublin* occurred to me, even within these narrow limits, being all from the county of *Dublin*, except the first from

(a) "There is a vale in the Island of *Iychia*, situated in the Bay of *Naples*, which has many hot Baths, and is subject to Earthquakes, where considerable quantities of Nitre are found, and a nitrous spring which whitens linen in three days." *London Magazine*, February 1753.

from the county of *Wexford*, which seemed to contain the native Alkali, the account of which, to avoid tediousness, I have here thrown together into one section, as further instances of the frequency of the native Alkali, viz.

1. A Well at *Kildermot* at the foot of *Tarah*-hill in the county *Wexford*. 2. A spring at *Kishoge* near *Escar* in the county *Dublin* of a bluish cast, and whose water is remarkable for not hardening butter, as common cold springs do, an appearance agreeable to an alkaline impregnation, since Acids coagulate Oils, but Alkalies dissolve them. 3. *Burton's Well* in *Stony-park* near *Agoe* in the parish of *Newcastle* and county of *Dublin*. 4. *Greenfield* well near *Tobber-bridge* in the same parish. 5. *Tobbergragan* near *Garristown* in the county *Dublin*.

Now of the sediments of these waters obtained by exhaling to dryness, two were remarkable for a high empyreumatic or urinous flavour, all of them turned of a bright green rubbed with Syrup of Violets, all of them smell'd pungent and fetid when rubbed with *Sal Ammoniac*, and a little pungent and strong when rubbed with Salt of Tartar.

It may indeed be objected that these appearances are equivocal, and may be attributed to a calcarious Earth as justly as to an Alkaline salt: but, besides the taste or flavour proper to such a Salt, the quick change and depth of the green-colour from the mixture of the Syrup of Violets argued also rather such a Salt; for tho' indeed the calcarious or absorbent Earths do also turn green with Syrup of Violets, and detach the volatile Salt from *Sal Ammoniac*, yet this colour with the Earths is commonly flower in striking and less deep, nor do the Earths that I know of ever emit a pungent smell when rubbed with Salt of Tartar, which the *Natron* or native Alkali does, as well as with *Sal Ammoniac*, as is elsewhere more minutely observed.

I shall next subjoyn an account of three waters transmitted

mitted to me from the county of *Fermanagh*, which contain a much greater quantity of the native Alkali than the foregoing, and which is combined with Sulphur, but from the greater proportion of Alcaline contents seem to demand a place rather among the Alcaline waters than among the Sulphureous, for which reason I have given them a place rather in this Book than in that of the Sulphureous waters: however, altho' these are but little known as a medicine, I apprehend that by reason of the strength of the impregnation both with the Sulphur and the native Alkali, they might have more powerful effects than several others of more fame, and therefore cannot but recommend them to the notice of Physicians.

S E C T. VI.

DRUMGOON first Spring.

THE first of these springs rises in the land of *Drumgoon*, contiguous to *Maguire's-bridge*, in the county of *Fermanagh*, about sixty-four miles from *Dublin*, on the S. W. edge of the strand of the great river of *Macguire's-bridge*, by which it is frequently overflowed, which might be prevented by building a wall to defend it from the fresh water, of which cost it is undoubtedly well deserving, and moreover is well situated with regard to accommodations for lodgings, &c.

It is a strongly Sulphureous water, and bears carriage to remote places; for having been bottled, cork'd, and rozin'd in good weather, *July 10, 1745.* and sent to *Dublin*, where it was opened *August 10.* following, it still retained the fetid smell it had at the fountain, and withal had the flavour of boiled eggs proper to most of our Sulphureous waters; and, as it had at the fountain shew'd its great strength in that, altho' diluted by the water of the neighbouring river above mentioned

mentioned overflowing it, yet it even then and there tinged Silver of a copper-colour immersed in it only two minutes; so when fresh opened in *Dublin* at the distance of time above mentioned, it tinged a piece of Silver of a copper-colour in a few minutes, which next morning became very deep and was of a blue and copper-colour underneath. Also the solution of Silver precipitated a dark-brown, grumous sediment from it, and the solution of *English* Vitriol a black one, so that it appears to be a more strongly Sulphureous water than several specimens of our famous sulphureous water of *Swadlingbar* sent to *Dublin* and examined there.

It lathers with Soap with scarce any previous curds, notwithstanding the pretty large proportion of Salt it appears by the sequel to contain, which Salt consequently is very remote from the acid nature of those constituting what we call hard waters.

It turns presently of a pretty deep green with Syrup of Violets:

It exhibits a minute ebullition, and a fine white cloud (*a*) with Spirit of Salt, and with Oil of Vitriol.

The Analysis.

I. *Natural*. It becomes wheyish and blue after the bottle has been opened two days and loses its *fetor*. The sand and sediment in the bottom of the well is very black, like the scourings of a gun or like gunpowder mixt with sand and water, and smells full as strong. Some of the black Sludge was bottled and sent to *Dublin*, where it arrived not until seven months after, when it made an explosion upon opening the bottle, and smell'd like smith's forge-water, and, being dried, sparkled and burnt blue on the red hot iron,

(*a*) Perhaps a beginning precipitation of the Sulphur, analogous to *Lac Sulphuris*, as is elsewhere observed of several of the Sulphureous waters, and owing to the Acid attracting the Alkali in the water, which last therefore lets go the Sulphur.

iron, with a suffocating smell, and it always crackled on the same red hot iron, as tho' impregnated with marine Salt, which is further confirmed by the saline taste of the artificial *residuum*, and its growing damp in the air.

2. *Artificial.* A gallon of the water exhaled left eighty-three grains of a light-brown sediment, which was of a saline and moderately lixivial taste and bitter in the throat, and actually warm on the tongue. It emitted a pungent smell when rubbed with *Sal Ammoniac*, as also when rubbed with Salt of Tartar, and it grew damp in the air. It lay still on the red hot iron and scarcely sparkled thereon.

The Salt separated from the indissoluble parts was brown, of a strongly lixivial and bitter taste, and fermented with Vinegar. The same Salt mixed with the blood fresh flowing from the vein rendered it more florid and less sizey than the unmixed blood flowing from the same vein. There seemed to be at least three times more Salt than indissoluble matter, which last flamed on the red hot iron.

Corol. The water of *Drumgoon* first spring, is strongly impregnated with Sulphur, and with a Salt like the *Egyptian Natron*, compounded of the native Alkali and marine Salt.

It is found by observation to be Diuretic and in some Emetic, and from the quantity of impregnating Salt it is highly probable it may prove purgative, at least if taken in a large quantity.

We have very little account from experience of the Virtues of this water, which however from its principles is probably possessed of the like Virtues as *Sweedlingbar* and others of the Sulphureous waters containing *Natron*, with this difference, that from the greater proportion of this Salt it contains, it may probably prove more aperitive by urine and stool, and likewise more powerfully attenuating.

The following accounts however of the empirical
S and

and casual use and effects of this water may not be unworthy of a place here, *viz.*

1. A drinker of Whiskey, by his constant use of that liquor got a Tremor in his hands and arms, so that he could not hold the glass to his head, and lost his appetite. Living on the bank of the river opposite to this spring, he through a frolick drank of the water for five mornings, whereby both his ailments were removed (a).

2. Two women in the neighbourhood were very ill, one with a disorder in her stomach, the other in her bowels; they both drank of the water for several mornings, and one threw up a large long Worm having two sharp points, by the mouth, the other voided several Worms by stool, and the ailments of them both vanished: and that the Sulphureous as well as Chalybeate waters are a good Anthelminthic may appear in the respective accounts given of them in the proper place.

S E C T. VII.

DRUMGOON *second Spring.*

THE second spring of this sort on the land of *Drumgoon*, is situate between the mill-race and the river of the little bridge opposite to *Carrew-Nuwy*, about a mile S. W. from *Macguire's-bridge*. It is much weakened by a small part of the mill-race which is just over it, as is the river within a perch under it, but it is not affected by the river.

It was examined on the spot, *August 30, 1747.* in fair weather when it was bottled, and in *Dublin*, where it arrived three months after.

It was of a pale pearl-colour, but became wheyish
on

(a) This is perfectly agreeable to other observations in this and my larger Work of the good effects of divers of the Sulphureous waters in nervous disorders.

on standing : Its smell was excessively fetid, being one of the strongest of the Sulphureous waters, and its taste like that of an over roasted or semi-putrid egg.

It lathered pretty soon with Soap and continued clear with Alkalies, an argument, concurring with others in the sequel, of its alkaline quality.

It tinged Silver of a darkish-colour on about five minutes immersion, not only on the spot, but in *Dublin*, at the distance of time above mentioned (so that it bears carriage well) where, after a night's immersion, the Silver became of a fusc and copper-like hue and partly blackish ; and the solution of Silver in *Dublin* turned it yellow and then red, and precipitated from it a fusc-yellow grumous sediment, and the solution of Copperas gave a dark-brown bluish cloud and sediment.

The Analysis.

1. *Spontaneous.* On standing it grew white as if mixed with chalk :

2. *Artificial.* A gallon exhaled to a driness left fifty-three grains of a white and yellowish sediment, of an urinous taste, and strongly bitter in the throat : It moistened and became tenacious in the air. Rubbed with Salt of Tartar it emitted a pungent and fetid smell, with *Sal Ammoniac* a highly pungent and urinous smell. It sparkled and stunk greatly on the red hot iron.

Corol. *Drumgoon* second spring is impregnated with nearly the same principles as the first, viz. Sulphur to a considerable degree, and the native alkaline Salt mixed probably with marine Salt and absorbent earth.

S E C T. VIII.

A third Spring near MAGUIRE's BRIDGE

RISES in the mearing between *Agbaascue* and the land of *Crincranal*, about three quarters of a mile S. W. from *Maguire's-bridge*, in a boggy ground not subject to floods.

It was examined on the spot, *September 7, 1747*, and in *Dublin*, where it arrived six weeks after it had been bottled, and was of a strong smell, as at the fountain, and had a flavour resembling that of roasted eggs.

At the fountain it tinged Silver of a dark colour in three minutes, and in *Dublin* Silver immersed in it a quarter of an hour became of a dusky and copper-colour, and next morning of a fusc and partly copper-colour, and blue; and the solution of Silver added to the water exhibited a dusky yellow cloud, the solution of Copperas a dark dun-coloured cloud.

The water curdles with Soap, and yields a white cloud with Alcalies, and consequently its Salt is less purely alkaline than the foregoing, and has probably a mixture of the calcarious Nitre.

The Spirit of Vitriol added to the water exhibited a white cloud and a few bubbles.

The Analysis.

1. *Spontaneus*. In the bottom of the bottles is a sediment like black dirt, which being dried, sparkled and stunk on the red hot iron.

2. *Artificial*. A gallon exhaled to dryness yielded sixty-four grains of *residuum*, of a white and brownish colour, of a strong smell, and of an urinous taste and bitter in the throat. Rubbed with Salt of Tartar it was strongly fetid, with *Sal Ammoniac* of a pungent and

and urinous smell. It did not sparkle on the red hot iron, but stunk like burnt bone or horn.

Corol. The third spring near *Maguire's-bridge*, is impregnated with Sulphur, an alkaline Salt and calcarious Nitre.

I shall next subjoyn two Tables, the first exhibiting a summary comparison of the *Irish* Alkaline waters compared with some of the more eminent of the foreign ones; the second a comparison of the Salts or Sediments of each.

Table IV.

T A B L E IV.

A Synopsis of the principal Appearances exhibited by the eminent of the foreign ones.

	Taste and smell,	Alcalies.	Solution of Silver.	Acids.
<i>Selters water, in Germany.</i>	Somewhat lixivious.	Milky, but no precipitation.	A gross white cloud and curd precipitated.	A great ebul- lition with the weakest acids.
<i>Tilbury water, in Essex.</i>	Soft and smooth	A white cloud, no precipitation.	A white curd precipitated, and a bluish colour.	A lasting e- bullition, even from weak acids.
<i>Clifton water, in Oxford- shire.</i>	Little taste.	A clayey sedi- ment with oil of tartar.	A pearl purple colour.	
<i>Wiggles- worth water, in Yorkshire.</i>	Saline and fe- tid.	Lathers with soap.	Brownish black.	
<i>Quin- Camel water in Somersetshire</i>	Fetid, and taste as of a boiled egg.	Mixes equally, or with very little cloud.	Brown, dusky yellow, and a dunnish sedi- ment.	A minute e- bullition.
<i>Tobber- bonny water</i>	Little taste.	A subtile white cloud with solu- tion of salt of tartar.	A deep pur- ple, but little se- diment.	A minute e- bullition.
<i>Carrick- more water</i>	Soft: fetid on keeping.	A white sedi- ment with solu- tion of salt of tartar.	No dark cloud nor sediment.	An ebullition.
<i>St. Bar- tholomew's well.</i>	Little taste: fetid on keeping.	Lathers with soap.	A tawny gru- mous sediment with the feid water.	Little change with spirit of vi- triol.

Exhibiting

Irish Alcaline Waters compared to some of the more

Syrup of Violets.	Galls.	Quant. of Contents in a gallon	Quality of Contents.	Operation.
Green.	A blue circle, and wheyish.	Gr. 288.	An alcali and marine salt.	Diuretic, sweetening
Deep green.	A blue circle, and a greenness underneath.	Gr. 180.	An alkaline salt, with an absorbent and ochreous matter.	Diuretic, sweetening, astringent.
A grass green		Gr. 74.	An alkaline salt, calcarious nitre and earth.	Laxative, antiscorbutic.
		Gr. 140.	Sulphur, alcali, and marine salt.	Purging and vomiting.
A light willow green.	No present change of colour.	Gr. 64.	Sulphur, alcali, marine salt, and calcarious earth.	
Green.	A pale blue circle.	Gr. 20.	An alcali, and calcarious earth.	
Green.	A bluish circle at the surface.	Gr. 22.	Calcarious nitre and earth, and an alcali.	Sweetening.
A dilute green	Little tincture.	Gr. 14.	An alcali, and latent sulphur.	

T A B L E IV.

Exhibiting a *Synopsis* of the principal Appearances exhibited eminent of the foreign ones.

	Taste and smell.	Alcalies.	Solution of Silver.	Acids.
<i>Cape Clear</i> water.	Insipid : fetid on keeping.	Lathers with soap.	A yellowish grume with the fetid water.	
<i>Drumgoon</i> 1 st spring.	Sulphureous, and taste like boiled eggs.	Lathers with soap.	A dark brown grumous sedi- ment.	A minute ebul- lition.
<i>Drumgoon</i> 2 ^d spring.	Very fetid : taste like a roasted egg	Clear.	A yellow gru- mous sediment.	
3 ^d spring, near <i>Drumgoon</i>	Fetid : taste like roasted eggs.	A white cloud.	A yellow cloud	A little ebul- lition.

Continued.

by the *Iris* Alkaline Waters compared to some of the most

Syrup of Violets.	Galls.	Quant. of Contents in a gallon.	Quality of Contents.	Operation.
A pale green		Gr. 16.	An alkali, and latent sulphur.	
Presently green.		Gr. 83.	Sulphur, alkali, and marine salt.	Diuretic, and to some emetic.
		Gr. 53.	Sulphur, alkali, marine salt, and absorbent earth.	
		Gr. 64.	Sulphur, an alkali, and calcareous nitre.	

Table V.

T A B L E V.

A Synoptic View of the principal Appearances exhibited by
pared with those of some of the more eminent of the

	Taste.	Alcalies.	Acids.	Milk:	Blood.
<i>Selters</i> water salt.	Lixivial and brackish.		A great e- bullition.		
<i>Tilbury</i> wat. salt	Sharp and uri- nous.	The solution clear, and la- thers smooth with soap.	A great fer- mentation.		
<i>Clifton</i> wat. salt.	Urinous, brack- ish and bitter.	Clear.	A great e- bullition with vinegar.	No coagula- tion.	
<i>Wiggle- worth</i> wat. salt.	Lixivial, brack- ish, bitterish.	Clear.	A strong e- bullition.	No coagula- tion.	
<i>Quin- Camel</i> water sediment	Very brackish and urinous.				
<i>Tobber- bonny</i> wat. salt	Lixivial and bitter.	Clear with oil of tartar.	A fermenta- tion.		
<i>St. Bar- tholo- mew's</i> water se- diment.	Bitterish and somewhat uri- nous.				
<i>Cape Clear</i> water se- diment.	Brackish, with an odd flavour.				

Exhibiting

the Salts and Sediments of the *Irisb* Alcaline Waters, compared with foreign ones.

Flesh.	Syrup of Violets.	Galls.	Sal Ammoniac.	Sol. of Merc. sub. corrosive in water.	On the red hot iron.
No redness on beef.	Bright green presently.		A pungent smell.	An orange-coloured sediment.	Crackled and fled.
Did not redden mutton.	Instantly bright green		A pungent and urinous smell.	A muddy, pale yellow-colour.	Melted, sparkled, burnt blackish, did not crackle.
Reddened mutton.	Bright green.		A pungent urinous smell.	Yellow.	Sparkled, stunk, lay quiet, and burnt black.
	Instantly green.	An olive-colour with the solution.	A pungent smell.	Yellow.	Sparkled, stunk, crackled and fled
Beef reddish.	Grass green.		A strongly pungent and urinous smell.		
	Bright green.		A pungent smell.	Obscurely reddish.	Lay quiet, stunk and burnt black.
	Deep green.		A pungent and urinous smell.		Sparkled and smell'd suffocating.
	Dark green.		A urinous smell.		Sparkled, and once crackled.

T A B L E V.

Exhibiting a Synoptic View of the principal Appearances
Waters, compared with those of some of the more eminent

	Taste.	Alcalies.	Acids.	Milk.	Blood.
<i>Drumgoon</i> 1 st spring sediment and salt,	Saline, lixivial, bitter and warm on the tongue.		The salt fermented with vinegar.		More florid, and less fizzy.
<i>Drumgoon</i> 2 ^d spring sediment.	Urinous, and nauseously bitter.				
3 ^d spring near <i>Drumgoon</i> sediment.	Urinous, and nauseously bitter.				

Continued.

exhibited by the Salts and Sediments of the *Iris* Alcaline
of the foreign ones.

Flesh.	Syrup of Violeta.	Galls.	Sal Am- moniac.	Sol. of Merc. sub.corrosive in water.	On the red hot iron.
			A pungent smell.		Quiet.
			A highly pungent and urinous smell.		Sparkled and stunk.
			A pungent and urinous smell.		Stunk like burnt bone or horn.

BOOK

BOOK V.

OF THE

Warm W A T E R S,

And particularly those of MALLOW.

S E C T. I.

Notwithstanding that the venerable *Bede* hath some where asserted, that there are hot springs in *Ireland*; if any such were ever known, they are long since lost, so that we have only one warm water of note, and this of very late discovery, viz. *MALLOW WATER*, of which, together with two tepid springs in the county of *Dublin*, and their comparison to the more celebrated of the warm and hot waters in other parts of the world, it shall suffice to give the following account here, and refer the curious to my general History of Mineral waters for further satisfaction.

Mallow-water was first discovered and introduced into practice by Dr. *Rogers* of *Cork* about the year 1724. and since that time hath greatly recommended it self by its Virtues.

Mallow is a Borough-town pleasantly situated on the northern banks of the river *Black-water* in the county of *Cork*.

The spring bursts out of the bottom of a great rock of Lime-stone, and near it are rocks of rotten and partly chalky Lime-stone.

It is a very limpid and well tasted water, and being agitated in the mouth, it left some degree of roughness

ness there, such as I observed in *Bristol*, another calca-
rious water.

It keeps excellently well in clean bottles, as I have
observed, even for four years and a half, when it still
continued limpid and well tasted, and seems to suffer
less separation of its parts than *Bristol*-water, as will be
further evinced in the sequel.

It is nearly of the same degree of Heat as the
Matlock-water in *Derbyshire*, and its Comparifon to the
Bristol and *Bath* water, &c. made by *Fabrenheit's* Ther-
mometre stood thus :

The Hot Bath at Bath	- - - -	114
<i>Bristol</i> hot well	- - - -	76
The hottest Bath of <i>Aix la chapelle</i> at the source		136
The merchant's warm spring near <i>Bristol</i>		68
<i>Mallow</i> -water	- - - -	68
A neighbouring cold spring	- - - -	50

Being brought a quarter of a mile from the spring
and compared to the *Black-water* river-water, it was
about six grains in a pint lighter than that water ;
but its specific gravity was more exactly determin-
ed by Dr. *Hewetson*, a physician on the spot, to be as
follows.

<i>Mallow</i> -water	- - - -	1531
River water	- - - -	1544
A Chalybeate water from <i>Bear-forest</i> .	-	1547

It is a softer water than many other of warm wa-
ters, lathering sooner with Soap, and washes linen
well, even when not warmed, but taken immediately
from the spring.

So Spirit of Hartshorn and Spirit of *Sal Ammoniac*
changed it but little from its transparency, Oil of Tar-
tar turned wheyish with it, and exhibited some small
sediment : Lime-water whitened it a little ; the solution
of Alum turned it wheyish and bluish, and in some
trials exhibited plenty of bubbles on the sides of the
glass ;

Smith's
nat. and
civil Hist.
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of Cork.

glafs: solution of Sugar of Lead whitened it, and gave some whitish sediment. With solution of Silver the appearances were remarkable, being pretty much as in *Bristol* water, so far at least, that when one compares them, there seems to be good reason to suspect some slight impregnation with Sulphur (probably from the Lime-stone) in both, viz. the said solution gave a pearl-colour, and withal a light purplish; and at another trial I observed a sudden transition of colours, from this solution viz. first a pearl-colour, then a purple, and next a bluish colour with some sediment.

It made an ebullition both with the stronger and weaker Acids, and with some of them a very considerable one; for even juice of Lemons added to this water exhibited many bubbles at the bottom and sides of the glafs after it had stood a good while, and Spirit of Vitriol, Spirit of Salt and Spirit of Nitre excited a minute ebullition; and Oil of Vitriol a conspicuous one, tho' it made scarce any ebullition at all with the water of the neighbouring canal, and a hard water near it.

I observed in some *Mallow*-water which I had kept four years, that even Vinegar added to it exhibited minute bubbles on the sides of the glafs, whereas *Bristol*-water kept four years made scarce any ebullition at all with this or other Acids.

May not this difference be owing to the larger proportion of terrestrial to the saline matter in *Mallow* than in *Bristol*-water, and withal to that matter being more minutely dissolved, subtilized and kept longer suspended in the first than in the last?

The tincture of Galls exhibited no change with this water; the powder of Galls in some of the water kept four years exhibited a bluish circle near the surface, which in three days became greenish; and Mutton infused and boiled in it was a little reddened: both these appearances are probably owing to its Nitre.

Syrup

Syrup of Violets turned it green.

It draws a grateful infusion from Tea, which *Bristol* water does not.

The Analysis.

1. *Spontaneous.* I observed the inside of a tin vessel wherein it stood twenty-four hours to be whitened as from an aspersion of chalk.

2. *Artificial.* I distilled three pints with a retort and a receiver to a dryness, luting well the junctures: it left a small quantity of calcarious matter; and it was observeable at least in this single experiment, (which I would recommend to be repeated) that the water which came over turned of a pearl-colour with solution of Silver, which on standing three hours, became of a dilute pink-colour, and next morning this mixture gave a white and brown sediment. This seems to shew that the Sulphur comes over in distillation, and if compared with the experiment on *Bristol* water with the same solution, is a confirmation of the presence of Sulphur in some degree in both waters.

Mallow water by a quick evaporation yielded but nine or ten grains of sediment from a gallon; but by a slow evaporation, it gave twenty grains from the same quantity; and it is observable, there appears very soon, even on the first boiling, (*viz.* much sooner than in common water) a separation of a chalky matter in the form of Scum (and fermenting with acids) and a whiteness on the sides of the vessel of the like appearance.

The sediment aforesaid is of a light-grey colour, of a brackish taste, grows damp in the air, makes an ebullition with acids, and turns of a bright green with Syrup of Violets.

The Salt is yellowish, somewhat unctuous, and stinks a little on the red hot iron, like turf. It is of a brackish and nauseously bitter taste, both in substance and solution: it blistered and sparkled on the

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red

red hot iron. It did not ferment with other Acids, but it fermented and emitted a penetrating fume (the Spirit of Salt) rubbed with Oil of Vitriol; in short, like the Salt combined with the calcarious matter in the *Buxton* and *Bristol* waters, it agreed to a mixture of calcarious Nitre and marine Salt.

The indissoluble parts separated from the saline were of a dark-brown colour, fermented with Acids, sparkled, and in one experiment flamed on the red hot iron, with a bluish flame and a little *fetor*, a further confirmation of some portion of Sulphur: being calcined two hours, it became whiter and acquired somewhat of a limey taste, and reddened a little with the solution of Mercury sublimate corrosive; so that it's a true Lime-stone.

The indissoluble matter bears a large proportion to the saline, *viz.* in one experiment as 2 to 1, in another, as 9 to 1, *viz.* a far greater proportion than the terrestrial matter bears to the saline in *Bristol* water, which was but as 15 to 11, or 13 to 11.

COROLLARY.

and

The Comparison of this and Bristol water.

Mallow water is a very mild, soft and light water, impregnated chiefly with an absorbent Earth, and a small quantity of marine Salt and Nitre, and probably a little impalpable Sulphur: it yields about the same quantity of the same principles as *Buxton* water, but less than *Bristol*, and yet as the absorbent Earth in *Mallow* water bears a greater proportion to the saline parts than in the *Bristol*, and withal this Earth in *Mallow* water seems to be more minutely attenuated and subtilized, it seems to have less acrimony, and to be intitled to as great virtues as an absorbent: it's a good deal softer than *Bristol* water, but its Heat according to the Thermometre, to that of the *Bristol*, as 68 to 76.

It seems not impertinent to add a hint concerning the cause of the Heat of this water: whether the *Acidum*
vagum

vagum in the bowels of the earth, or the meer Vapor of warm water be the *Menstruum* which nature makes use of in dissolving the calcarious matter might admit of a dispute; that the last is here present is manifest to our senses, as is also a soft, calcarious matter, in the soft Lime stone found here, which that it may be dissolved by the meer Vapor of warm water seems highly probable from the known power this has of dissolving even the more compact substance of Hartshorn, which thus prepared, is called *Cornu Cervi philosophicè præparatum*.

If this conjecture be right, the calcarious matter impregnating this water, is not the cause of the Heat of the water, but the effect of the subterranean Heat of the Vapor of water dissolving it where it meets with it, as it's probable that the like Heat also sometimes dissolves other Minerals it happens to meet with in its passage, as Iron, Nitre, Salt, Sulphur, Bitumen, &c. with which our baths and warm waters are as variously impregnated as the cold mineral waters, and sometimes *viz.* where the watry Vapor meets with none of these Minerals, or a very small proportion of them, it forms simple or pure waters, as seems to be in a great measure the present case.

The industrious *Morton* in his natural History of *Northamptonshire* observes, that wheresoever the Earth has been laid open by digging to any considerable depth, there is always found a warm watery Vapor, as well in Caves and Grottoes as in Wells, and the trials he made with the Thermometre, which rose from half an inch to an inch when suspended in several Wells, did undeniably attest the truth of this proposition, that there is such a quantity or degree of Heat within the Earth as is sufficient for raising up water in the form of Vapor: and it is from this under-ground Heat that the water of our rock springs as we call them, is never frozen, even in the sharpest frost, and sends forth a copious steam, and will thaw any water that is but

Smith's
nat. and
civil Hist.
of the C.
of Cork.

thinly iced over, that it is thrown upon, and that the herbs which grow upon the channels of them, especially near their sources, are perpetually green, and that snow that falls there melts more suddenly than in places at a distance; to which I add that it is probably from the same cause that there are several Lakes which never freeze, particularly that at *Mohannab* near *Dunmanaway* in the county of *Cork*, which did not freeze in the great frost in 1739, and the *Lough Neefs* in *Scotland* which never freezes, but emits Vapors in winter.

The experiments above mentioned with the Thermometre in the places aforesaid, do by no means suit to the opinion of those who imagine that Heat in the Earth is found only in the deeper mines, or in such places as are stored with Bitumen, Sulphur or other igneous materials, and that it is generated of such kind of matter; for the same Author assures us, that in the places where he made these experiments there are no vestiges of any Minerals which by their colluctance might produce it, and that there can hardly any where occur a tract of ground where there is less mineral matter of any kind than here; and yet in all places where the *strata* are open, there is a sensible Heat, and it seems highly probable that such a degree of Heat subsists here, raising a watry Vapor which dissolves the calcarious matter in its passage wherewith our *Mallow* waters are impregnated according to the *Analysis*.

The Operation and Virtues of this water as far as hitherto determined by experience come next to be considered: and

First, there is one peculiar advantage in the use of this and other waters endued with the like small degree of Heat, that it is attended with less danger, and requires less caution than the hotter Baths, such as *Aix la chapelle*, *Bath*, &c. To this agrees the testimony of the learned *Baccius* concerning the temperate waters,

ters, who having given a recital of several of them, speaks thus : *Hujusmodi Aquæ siccant præter Aquæ naturam, ad usum omni sexui omniq; ætati idonea, tam jure balnei quam potuum, & tam sanis quam ægrotis, nonnullæ etiam, declinante morbo, & pægressa concoctione; febrientibus utiles*; and moreover, whereas several of the hot Baths are remarkable for extenuating gross habits, divers of these, on the contrary, by gently bringing the humours to the circumference, do fatten lean ones. But

The following instances of the good effects of *Mallow* water respect entirely its internal use, scarce any of its meer external application having occurred to me, except perhaps of its having cured some sore and running eyes, and one Observation I also happened to meet with of the use of the Steam under the arch, (with which this water is indeed very properly covered, as the *Buxton* Bath is, in order to reverberate the Steams and preserve and improve the warmth of these tepid waters) which Steam is felt sensibly warm by such as come out of the cold air; and a certain person assured me that he had tried it with success to raise a sweat (a).

But to proceed to the internal use; as it is a water of exquisite softness, free from all acrimony and gently absorbent, it seems adapted to the cure of several disorders of the stomach where the unhappily delicate fibres are easily irritated from an acrimony in other waters insensible to the sound and strong.

It is an excellent diluter, absorbent or sweetner, drier and healer; and I might add, in some cases attenuating and dissolving, as may appear from the sequel.

T 3

Its

(a) In *Italy* are many subterranean Grottoes from subterranean fires, made warm enough to excite a copious sweat, for which purpose they are frequently resorted to in cold diseases, Catarrhs, Deafness, and other Diseases of the head, weakness of the Nerves, the Gout, and many other maladies.

Colonne Hist. del' Univers, & Casalpini de Metallis.

Its sensible Operation is for the most part by urine, yet it has been found sometimes to purge in the beginning (*b*) and some it sweats, and it frequently throws out pimples on the skin.

I shall begin with its Virtues in disorders of the *primæ viæ*. Dr. Rogers had a certain lady under his care in a very weak state, who could keep no aliment upon her stomach, and was so far reduced, that her recovery was despaired of; but on an accidental trial of this water, found it to be the only liquor that would stay in her stomach, and persisting in the use of it, recovered, which was the first occasion of its being introduced into medicine.

Smith's
nat. and
civil Hist.
of the C.
Cork.

See else-
where a
like ac-
count of
Buxton
waters.

As it is qualified as above, and besides, free from the inconveniences of actual cold, it is found not to chill the stomachs of even old drinkers, of which I saw an instance in one long accustomed to drinking drams, who used to be very uneasy every morning before he got his dram; but upon having recourse to this water, bore the want of his dram without that inconvenience.

An elderly gentlewoman troubled with an habitual Vomiting, together with a pain at the stomach, after an ineffectual use of other medicines, was much relieved by the use of this water.

A tender weakly young lady long troubled with a retching to vomit, which did not seem to proceed from any fault in the humors, but an easy irritability of the nerves, being excited by fatigue or any commotion of mind extraordinary, was greatly relieved by drinking these waters: Nor are there wanting instances of their good effects in Colics and inveterate pains of the stomach, habitual flatulence, and some hysterical cases; also inveterate *Diarrhæas* have been stopt by their use.

But the good effects of this water are not confined to the *primæ viæ*, but extended to the urinary passages, breast

(*b*) Compare the account of the *Bristol* water, which has sometimes a like effect.

breast and several remoter stages of the circulation : for I heard of several instances of its good success in the Gravel, some of old Gleet's stanch'd by the use of this water, and giving Rhubarb once a week, and that it has been serviceable in the *Fluor albus*, a *Mictus involuntarius*, and the Diabetes, and according to Dr. Rogers, in all profusions of the blood and humors ; and he acquainted me of two persons under his own observation, the one very gouty and near seventy, the other about fifty-five, both relieved in the Diabetes by the assistance of these waters and other conspiring medicines ; and I apprehend scarce any person conversant in practice who knows of how little efficacy in this malady the medicines of the shops are, will doubt whether the waters had not the most considerable share in the effect : here it agrees to the *Bristol* water, as it does also in checking immoderate secretions of phlegm from the lungs and adjacent parts, curing Catarrhs and Coughs ; some inveterate Coughs having been rendred more tolerable by the use of it, and one of some years standing after a Pleurisy, was cured by it.

Of its cooling and strengthening quality, and of its efficacy in stopping Defluxions, the following History may serve as an instance :

A gentleman about fifty given to hard drinking, had a fiery, ulcerated face, and withal was become very weak and unable to bear the cold, had callosities in his feet, and an habitual Catarrh with a copious discharge of phlegm every evening in the winter, but in summer-time all the day more moderately.

In this state he came to these waters in winter, and continued their use all that season, when they agreed with him as well as in the following summer ; (a)

T 4

after

(a) Not only the *German Spaw* and other Chalybeates are found to be strongest in the coldest weather, but warm waters of this kind are also observed to be warmer, even by the Thermometre, in that season, which is therefore proper, in cases of necessity, for drinking these waters.

after he had taken them three days they purged him for a week.

His discharge of phlegm hereupon, in the winter was so far abated as to be only equal to what it used to be in summer, and he became free from those periodical returns before mentioned in the evening: I saw him the summer following in *August*, when his face look'd pretty well, he was able to bear the absence of a fire much better than formerly and the Callosities in his feet were vanished.

Two persons in *Hæmoptoe's* drank these waters with success: in one of them this discharge was periodical, preceded by shivering, and attended with loss of flesh, and the *Bristol* waters had been drank several years, and then the *Mallow*, which last gave the greatest relief.

The other instance of *Hæmoptoe* was attended with hectic heats and colliquative sweats, and the disease was much palliated by drinking these waters.

So Consumptions, even in the last stage, have been sometimes cured by them, of which *Ensign Hill* was a memorable instance, who having undergone the operation for the *Empyema*, had an Ulcer in his lungs, purulent, fetid spits mixed with blood, night sweats and swell'd legs, and was perfectly cured by drinking these waters, and *Dr. Rogers* gave me another instance of an Atrophy with Hætic, *Diarrhæa* and colliquative Sweats cured by them.

Compare
the effects
of *Bristol*
water
elsewhere
related in
this case.

Next, as a proof of the attenuating, dissolving quality of these waters, I have been assured of some large and hard Tumors resolving under a course of them; and among these, a *Scirrhus* in the breast threatening a Cancer by drinking these waters for two seasons.

Lastly, there are several instances of Eruptions on the skin removed by this water, out of which I shall select two, neither of them of the slightest kind.

1. A young woman had been for three years troubled with obstinate eruptions on her head and face, and her fingers were so swelled, hot, scurfy, dry and chipping

chipping, that she could not use her needle; after an ineffectual trial of other medicines, she went to *Mallow*, and used the waters both externally and internally, and in six weeks recovered, but next spring the disorder began to return, wherefore she repeated the use of the waters, and had continued free from her complaints for three years, at the time of my enquiry.

2. A middle aged man had for some years been troubled with small hard Tumors on the skin attended with itching, which used sometimes to continue hard for a week or two, and then disappear spontaneously: they were sometimes colourless, at other times black and blue: withal he was sometimes distressed with an oppression and difficulty of breathing, loss of appetite and great restlessness at nights:

In this state he went to *Mallow*, and without any preparation, drank of the water freely morning and evening and used it in his Tea: after a while, there succeeded a more plentiful appearance of Pustules on the skin, but different from the former, being like blisters from burning, which affected first his feet and legs, arms and thighs, and then the trunk of his body: hereupon he took some doses of physick, but still continued the use of the waters until the disorder of his skin disappeared, and he recovered perfectly his appetite, rest, &c.

The justness of the above accounts of the Virtues of *Mallow* water is confirmed by the following summary relation of its good effects communicated to me *March 1st, 1757.* by Dr. *Rogers* (a Physician of eminence, and long experience in the neighbourhood above mentioned) viz. that "the cases in which he found the most remarkable effects of this water, were *Diabetes's*, hot *Scurvies*, the *Fluor albus*, and *Hæcticks*."

And to this I shall subjoyn, as nearly correspondent, and withal furnishing a more minute account of the circumstances in which these waters have exerted their
good

good effects, the following result of a continued series of observations made on them during a residence of fifteen years on the spot, by Dr. *Robert Houston*, which he was pleased to favour me with, *viz.*

“ S I R, In many repeated cases, I have found the *Mallow* waters of singular service in curing the following disorders, *viz.*

“ In relaxed habits with bad appetites, occasioned by debaucheries of any kind, in flatulent Colics with bad digestion from an acid acrimony, or in languid habits, in *Hæmoptoes*, in a Diabetes, the *Fluor albus*, in the Gravel, in Ulcers and other disorders of the kidneys or bladder, in Gleet and seminal weaknesses, slow Hectics. nervous Atrophies, and those consequent upon ill-cured Pleurisies and Peripneumonies, even where the symptoms were such as gave just suspicion of tubercles formed in the lungs, in Scurvies, and in constitutions weakened by slow lingering Fevers; briefly, in most disorders occasioned by a general laxity of fibres, and a predominant acid acrimony.”

“ I have frequently observed patients to be alarmed on their first drinking of the waters by a dizziness, with a coldness and weight of the waters in the stomach, and a tension thereof; but this is removed by giving a gentle cathartic now and then, and drinking the waters in small quantities, particularly the first glass in bed, and using such exercise between each glass, and repeating it at such a distance of time, as that the former may have passed out of the stomach before a second is drank, for which the patient's own observation is the best rule.”

“ I have also observed a general error prevailing among the water-drinkers here, *viz.* drinking too large quantities of the water, and too often repeated in the morning, and neglecting it the remaining part of the day, by which method the already too much relaxed state of the fibres, and weakness of the stomach is further increased, or the waters pass off too quickly to imbue the

the

the vitiated fluids or weakned solids with their medicinal virtues."

Your humble Servant,

Mallow April 28, 1757.

ROBERT HOUSTON.

S E C T. II.

The tepid Spring at St. MARGARET's near Dublin.

THERE are two tepid springs in the county of *Dublin*, which altho' of a degree of Heat considerably inferior to that of *Mallow*, seem not unworthy of a description in a general History of the mineral waters of this Island.

The first is commonly known by the name of *St. Bridget's-well* at *St. Margaret's*, near the Charity-houses on the lands of the late *Nicholas Plunket, Esq;* four miles *North* from the city of *Dublin*.

It is a perennial spring, of the same heighth in winter and summer, commodiously walled in for bathing, and spread in a large surface of six yards and one foot long, and three yards broad, whence it soon cools. In the neighbourhood is Marl and plenty of Lime-stone.

It is a limpid water, of a very soft taste, and much esteemed for its purity in drinking, drawing Tea, and washing.

It smoaks in winter, and was never known to freeze. It is colder than the air in summer, (a) and warmer than the air in winter, so that in cold weather it feels as comfortable as a warm Bath; and indeed if it were covered, in order to reverberate the Steam, as the springs of *Buxton* and *Mallow* are, it might make a warm Bath in winter.

It raised the Linseed-oil in Dr. *Robinson's* small portable Thermometre in summer half an inch, and in cold weather three quarters of an inch higher than a neighbouring cold spring did; these springs being, according to Dr. *Short's* Observations, absolutely warmer

(a) Or rather in hot summer weather; for *July 20 1752.* at 9. morn. wind N. W. it raised *Fahrenheit's* Thermometre from 52 (where it stood in the air) to 55.

warmer by the Thermometre in winter than in summer.

But the degree of Heat is more accurately determined by *Fabrenheit's* Thermometre thus, wherein

The freezing point is	- - - - -	32
Temperate	- - - - -	48
St. <i>Margaret's</i> water	- - - - -	51
<i>Mallow</i> water	- - - - -	68
<i>Bristol</i> Hot well	- - - - -	76
The Hot Bath at <i>Bath</i>	- - - - -	114

It is a soft water, not much loaded with calcarious Earth or Nitre; for it soon lathers with Soap, yields only a subtile cloud and whiteness with solution of Salt of Tartar, a small white sediment with the solution of Sugar of Lead, and a bluish cloud, with a small bluish subsidence with the solution of Silver, pretty much as the *Bristol* water, a probable indication of some degree of a sulphureous impregnation in both, perhaps from the Lime-stone.

Oil of Vitriol made a considerable ebullition with it.

Syrup of Violets turned it greenish: Galls exhibited a bluish circle at the surface of the mixture in the glass.

The Analysis.

1. *Spontaneous.* A bottle of it kept from *January* to *July*, did not stink, but exhibited a dirty sediment of a pale colour, which flamed on the red hot iron.

2. *Artificial.* A gallon of it yielded twenty-six grains of a whitish-brown sediment, of a taste somewhat brackish and bitter: it presently grew moist in the air: it sparkled and stunk on the red hot iron, and in one trial plainly flamed on it.

It turned of a deep green with Syrup of Violets, even much deeper and sooner than did some *Nitrum calcarium* rubbed with the same Surup: it smell'd somewhat pungent and urinous rubbed with *Sal Ammoniac*,

moniac, and pungent and sulphureous rubbed with Salt of Tartar.

The Scum arising on evaporation, and the white matter separated on the sides of the pan shewed their calcarious nature by fermenting with Oil of Vitriol.

The Salt separated from the indissoluble parts is yellow, of a pungent taste and bitterish in the solution: it fermented a little with Spirit of Salt and emitted a little of a pungent smell when rubbed with *Sal Ammoniac*.

The indissoluble matter separated from the saline became a strong Lime by calcination, as appeared from the taste and its turning first yellow, and then red with the solution of Mercury sublimata corrosive.

Corol. It deserves a place among the tepid calcarious waters, and as such is annexed to the *Mallow* water: it has much the same principles as that and *Buxton* and *Bristol* waters, viz. Lime-stone, marine Salt, and Nitre, and a little Sulphur, and so might be no bad *Succedaneum* for the *Bristol* or *Buxton* waters; but with this difference, that its Nitre is of a kind tending to Alkali called *Natron*, like that of *Bingham* warm water near *Buxton* Bath mentioned by Dr. *Short*.

It is found excellent in bleaching Linen, to which its purity and softness and the quality of the impregnating Salt above mentioned seem to contribute.

S E C T. III.

The tepid Spring near BALLYDOWD,

THE other tepid Spring in the county of *Dublin*, tho' less known than the former, seems to be rather a little warmer.

It is situated in a low ground by the side of the river *Liffy*, near *Ballydowd* or *Hermitage*, opposite to the house of the late ----- *Hawkins* King at Arms.

In

In the neighbourhood is Lime-stone and Lime-stone-gravel.

In frosty weather it appears to the touch almost as warm as new Milk. In *August* 1750. it raised the Linseed-oil in Dr. *Robinson's* portable Thermometre $\frac{1}{2}$ of an inch higher than the river did, but in a frosty day, *December* 30, 1751. it raised the same $1\frac{1}{4}$ inch higher than the river. At the same time *Fahrenheits* Thermometre stood

In the open Air at	- - - - -	20
In the river <i>Liffy</i> at	- - - - -	18
In this Spring at	- - - - -	52

Examined in *August* 1750. it was limpid and well tasted; but it has been observed in winter to be somewhat harsh and disagreeable, and to betray something ferruginous to the taste.

It curdled with Soap, and gave a white cloud with the solution of Pot-ashes, and with the solution of Silver a white cloud and grumous sediment, which on the spot in winter soon became of the colour of pale Indigo.

Spirit of Vitriol excited some fermentation with it.

Galls (in frosty weather) gave it a slight shade of purple; Syrup of Violets a light green.

The Analysis.

1. *Spontaneous.* The Scum and an ochreous subsidence on twigs of trees accidentally fallen into the well, betray something ferruginous.

2. *Artificial.* A gallon yielded fifty-four in one trial, and in another fifty-six grains of sediment of a dark-brown colour, of a very sharp and brackish taste and strong flavour:

It liquified in the air, made a great ebullition with Spirit of Vitriol, turned of a bright green with Syrup of Violets, and rubbed with *Sal Ammoniac* smell'd
fetid

fetid and pungent : Also it yielded in some small parts to the Magnet.

The upper part of this *residuum* on the sides of the pan, had not only the look and taste of marine Salt, but emitted a strong-smelling fume with Oil of Vitriol.

Corol. It is a much harder water than either of the two foregoing of *Mallow* or *St. Margaret's*, and has near treble the quantity of contents that *Mallow* water has, which consist chiefly of marine Salt combined with a pittance of *Natron*, Ochre and Sulphur.

I have been assured, that this water is somewhat purgative in Operation, which agrees to the predominancy of marine Salt shewn in the above *Analysis*.

Table VI.

T A B L E VI.

A SYNOPTIC VIEW of some of the principal divers of the foreign Baths and Warm Waters.

	Degrees of heat.	Taste and smell.	Gravity.	Alcalies.	Acids.
<i>Aix la Chapelle.</i>	Various, some agreeable, others scarce tolerable to the touch.	Various, some sweet, others sulphureous.		Milky with solution of salt of tartar.	Some ebullition.
<i>Bourbon.</i>	Scarce tolerable to the touch at the first springing.	Of a lixivial taste, little smell.			
<i>Bareges baths.</i>	The hottest equals scalding water, and <i>Fahrenheit's</i> Therm. stands in it at 113.	Smell and taste like eggs whereon a hen has sat.	Much like that of a neighbouring river.		No ebullition.
<i>Bath in Somersetshire.</i>	Of the Hot Bath as great as can well be endured; and <i>Fahrenheit's</i> Therm. stands at 114, but in the Cross Bath at 107.	A smell somewhat ungrateful, especially the hot bath: on the spot, a milky soft taste: at a distance somewhat nauseous and saline.	Twenty-two grains in a pint heavier than distilled water.	Milky.	Some intestine motion.
<i>Buxton baths.</i>	Temperate: By the <i>Buxton</i> 59 same } <i>Bristol</i> 52 Therm. } <i>Bath</i> 90 but not <i>Fahrenheit's</i> .	Taste sweet and pleasant.	Eight or ten grains in a pint lighter than river water.	A white sediment.	An ebullition.
<i>Bristol water.</i>	The hot well raises <i>Fahrenheit's</i> Therm. to 76, that of the merchants of <i>Bristol</i> to 68.	A soft taste.	<i>Bristol</i> water 18495. Rain-water 18485.	A white sediment.	An ebullition.
<i>Matlock bath.</i>	By the same } <i>Matlock</i> 45 Therm. } <i>Bristol</i> 52 but not <i>Fahrenheit's</i> .		A penny-weight in a pint lighter than common water.	A white sediment.	An ebullition.

IV Containing

Appearances exhibited by the above Warm Waters, and

Silver and its Solution, Gold, &c.	Galls.	Quant. of Contents in a gallon	Quality of Contents.	Operation.
A white sediment, with the solution: turns the substance yellow, red and blackish.	Milky.	Gr. 240.	Earth, an alkaline salt and marine salt.	Diuretic, purgative, absorbent, deobstruent, drying, attenuating, softening, corroborating, cleansing and healing.
	No tincture	Gr. 200.	Chiefly an alkaline salt, and some bitumen & earth.	Sudorific, laxative, attenuating, heating, drying and healing.
Blackens silver.	No change.	Gr. 17.	Bitumen, sulphur, and a little alkaline salt.	Softening, resolving, healing.
No change of colour by the immersion of silver, gold or copper for any short time; but the solution of silver exhibits a bluish cast and a dark grey sediment with the <i>King's Bath</i> and <i>Hot Bath</i> .	Purple, fresh from the pump.	Gr. 110. or 130.	A marly earth, ochre, marine salt, a little nitre, and a pittance of impalpable sulphur.	Diuretic, sudorific, opens the belly, heating, drying, attenuating, corroborating, sweetening and healing.
Does not tinge silver immersed, but brightens solution of gold.	Green.	Gr. 10.	Calcareous earth, marine salt, a little nitre and impalpable sulphur.	Sweetening, drying, cooling, astringent.
A blackish sediment with the solution.	Green on standing.	Gr. 35. perhaps may be the most just comparative estimate.	Calcareous earth, a little nitre, marine salt, and impalpable sulphur.	Absorbent or sweetening, astringent, healing, cooling.
	A slight purple tincture.	Gr. 40.	An alkaline earth, with a little nitre and marine salt, and iron	Absorbent or sweetening, astringent & healing.

T A B L E VI.

Being a **SYNOPTIC VIEW** of the principal
divers of the foreign Baths and Warm Waters.

	Degrees of heat	Taste and smell.	Gravity.	Alcalies.	Acids.
<i>Mallow water, co. Cork.</i>	<i>Fahrenheit's Ther- mometre 68.</i>	Well tasted.	<i>Mallow water 1531. River water 1544.</i>	Wheyish.	An ebul- lition.
<i>Bally- dowd, co. Dub- lin.</i>	<i>Fahrenheit's Ther- mometre 52.</i>	Somewhat harsh and dis- agreeable in winter.		A white cloud.	Some small e- bullition.

Continued.

Appearances exhibited by the above Warm Waters, and

Silver and its Solution, &c.	Galls.	Quant. of Contents in a gallon	Quality of Contents.	Operation.
Pearl-coloured and purple with the solution.	Greenish on standing.	Gr. 10.	An absorbent earth, a little marine salt, nitre & impalpable sulphur.	Absorbent, drying, astringent, healing.
A white grumous, and then blue sediment with the solution.	A very slight shade of purple in winter.	Gr. 54.	Chiefly marine salt, with a little natron, ochre & sulphur.	Opens the belly.

B O O K VI.

Of the purging

W A T E R S
O F I R E L A N D.

S E C T. I.

Of the Nitrous W A T E R S.

IN my general History of Mineral waters, I have given several instances of such wherein the calcareous Nitre was the predominant Salt, but in this kingdom I have hitherto met but with one such, *viz.*

The purging Water near CARRICKFERGUS

Which, with regard to the nature of the impregnating Salt is entirely different from the saline spring near *Carrickfergus*, and the brackish spring of *Kilroot*.

It was sent me by Dr. *Andrew Smith* of *Belfast*, under the denomination of a purging water situated in the suburbs of *Carrickfergus*, being used as such by the country people.

At the fountain-head, it was of a bluish colour, very soft to the taste, and left a sweetness, with a gentle astringency behind it on the palate, which taste it also manifested here, but had lost the bluish tincture, and was become limpid: it does not manifest its bitterness until its salts are concentrated by the exhalation of the aqueous parts, as we shall see in the *Analysis*.

Sect. I. *Of the Nitrous Waters.*

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lysis, which is also observable in the *Pancras-water* near *London*.

The comparative Specific Gravity, examined by the Hydrometre, was as follows inversely, (*viz.* the lowest point here shews the greatest Gravity)

The Saline Spring near <i>Carrickfergus</i>	-	0. $\frac{1}{2}$
The brackish water of <i>Kilroot</i>	- -	3. 0
The purging water in the suburbs of <i>Carrickfergus</i>	4. $\frac{1}{2}$	
Distilled water	- - - -	5. 0

But, notwithstanding the comparative lightness of this water, it exhibits most of the essential characters of an impregnating calcarious Nitre, *viz.*

It curdles and instantly deposits a white sediment with the solution of Salt of Tartar, exhibits a white incrustation at the sides of the glass with Spirit of *Sal Ammoniac*, and curdles strongly with Soap; exhibits a white yellowish cloud, and turns bluish with a small sediment with solution of Silver, and wheyish with a small whitish sediment with Sugar of Lead, but it was clear with solution of Alum.

Oil of Vitriol and Spirit of Salt made but a minute ebullition with it.

Boiled with equal parts of Milk curdled it with a clear whey :

The water boyled Beef white, nor did the solution of the Salt redden it :

Syrup of Violets struck it of a pale green, Ash-bark of a bright blue, Rhubarb of a deep yellow, Brazil of a pale crimson fading to the colour of *Lobelia carnium*, and Logwood a pale purple, also soon fading :

Galls infused soon exhibited a bluish circle near the surface, and Sumach turned it wheyish, and exhibited a deep green circle to a considerable depth next morning.

The Analysis.

A GALLON yielded 132 grains of *Sediment* : when
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it was evaporated low, it manifested a bitterness not sensible before, and during evaporation it threw up a calcarious Scum fermenting strongly with Spirit of Salt.

The Sediment has far less acrimony and less bitterness than is observable in the Sediments of most purging waters, being but of a weakly saline and obscurely bitterish taste: it fermented with Vinegar, and turned slowly green with Syrup of Violets: on the red hot iron it lay still, stunk, but did not sparkle.

The Salt separated from the indissoluble parts is of a brackish taste and bitter in the throat: so the filtered liquor from half a dram of the sediment boiled in a pint of distilled water to half a pint, is nauseously bitter, and precipitates a large white grumous sediment with solution of Salt of Tartar, and a white sediment with solution of Silver, but less in quantity than was yielded by a solution of equal strength of the Salt of *Kilroot* water, the last being a marine Salt.

The same Salt in substance excited a moderate ebullition, and an acid fume with Oil of Vitriol, but no ebullition with Vinegar:

Half a dram of it boiled with half a pint of Milk curdled it, tho' not with a limpid whey:

It moistened in the air:

On the red hot iron it did not rise in blisters like common calarious Nitre, but lay still there and burn'd black.

Of *indissoluble matter* the above sediment yielded but six grains out of thirty-three of sediment, which indissoluble matter sparkled much on the red hot iron, was by an hour's calcination become very white and reduced from six grains to four: It reddened a little with the solution of Mercury sublimate corrosive in water, and by a farther calcination acquired a little of the taste of Lime.

Corol.

Sect. II. *Of the Nitrous Waters.*

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Corol. The principal impregnating Salt is calca-
rious Nitre, and this in a very moderate proportion,
with which is combined a little marine Salt, some
Lime-stone, and a little Sulphur.

As to the *Dose and Use* of this water, as far as yet
known; it is found to be purgative by the experience
of the common people, tho' it requires a large quan-
tity, as six pints, to produce any notable effect. Three
pints and a half gave me three stools in the space of
two hours and an half, and no gripes, but great plenty
of urine.

It seems to be an useful mild purging water, and
on account of its mildness preferable to several others
where there might be danger of irritation from too
great acrimony. Accordingly, the people of the town
during the epidemic Dysentery about the year 1741.
used frequently a posset of it with milk, which purg-
ed them considerably, and they found great benefit
by it; and doubtless, such a medicine as not only di-
luting and correcting, but carrying off the acrimony,
was far more safe than meer Astringents confining it
within.

S E C T. II.

*Of the Saline purging Springs, and their compositions,
the Salino-Nitrous and the Salino-Chalybeate.*

A Saline spring near CARRICKFERGUS.

THIS is the only water I have yet met with in
this kingdom, whose saline contents bear any
proportion worth notice to those of the Brine springs
abroad, which last contain so much Salt as to be of
great advantage to the proprietors.

It is situated many yards higher than the sea, or
than the mark of the highest tide, and a mile from
the sea; as is also the following saline spring of *Kilroot*;
and it is observable that both these springs are found
in

it was evaporated low, it manifested a bitterness not sensible before, and during evaporation it threw up a calcarious Scum fermenting strongly with Spirit of Salt.

The Sediment has far less acrimony and less bitterness than is observable in the Sediments of most purging waters, being but of a weakly saline and obscurely bitterish taste: it fermented with Vinegar, and turned slowly green with Syrup of Violets: on the red hot iron it lay still, stunk, but did not sparkle.

The Salt separated from the indissoluble parts is of a brackish taste and bitter in the throat: so the filtered liquor from half a dram of the sediment boiled in a pint of distilled water to half a pint, is nauseously bitter, and precipitates a large white grumous sediment with solution of Salt of Tartar, and a white sediment with solution of Silver, but less in quantity than was yielded by a solution of equal strength of the Salt of *Kilroot* water, the last being a marine Salt.

The same Salt in substance excited a moderate ebullition, and an acid fume with Oil of Vitriol, but no ebullition with Vinegar:

Half a dram of it boiled with half a pint of Milk curdled it, tho' not with a limpid whey:

It moistened in the air:

On the red hot iron it did not rise in blisters like common calarious Nitre, but lay still there and burn'd black.

Of *indissoluble matter* the above sediment yielded but six grains out of thirty-three of sediment, which indissoluble matter sparkled much on the red hot iron, was by an hour's calcination become very white and reduced from six grains to four: It reddened a little with the solution of Mercury sublimate corrosive in water, and by a farther calcination acquired a little of the taste of Lime.

Carol.

Corol. The principal impregnating Salt is calcareous Nitre, and this in a very moderate proportion, with which is combined a little marine Salt, some Lime-stone, and a little Sulphur.

As to the *Dose and Use* of this water, as far as yet known; it is found to be purgative by the experience of the common people, tho' it requires a large quantity, as six pints, to produce any notable effect. Three pints and a half gave me three stools in the space of two hours and an half, and no gripes, but great plenty of urine.

It seems to be an useful mild purging water, and on account of its mildness preferable to several others where there might be danger of irritation from too great acrimony. Accordingly, the people of the town during the epidemic Dysentery about the year 1741. used frequently a posset of it with milk, which purged them considerably, and they found great benefit by it; and doubtless, such a medicine as not only diluting and correcting, but carrying off the acrimony, was far more safe than meer Astringents confining it within.

S E C T. II.

Of the Saline purging Springs, and their compositions, the Salino-Nitrous and the Salino-Chalybeate.

A Saline spring near CARRICKFERGUS.

THIS is the only water I have yet met with in this kingdom, whose saline contents bear any proportion worth notice to those of the Brine springs abroad, which last contain so much Salt as to be of great advantage to the proprietors.

It is situated many yards higher than the sea, or than the mark of the highest tide, and a mile from the sea; as is also the following saline spring of *Kilroot*; and it is observable that both these springs are found
in

in a *red marley clay*, which is the very same kind of soil in which the Brine-spring pits at *Droytwich*, *Northwich*, *Nantwich* and *Middlwich* are found, in which soil and stratum also is found the salt Rock above *Liverpool*, as the ingenious *Arthur D lls*, Esq; observes: however, the specimen of this water transmitted to me by my friend *Dr. Smith* of *B. lfast*, tho' much stronger than *Kilroot* Spring, and than several other of the saline medicinal *English* springs, is far short of the strength of the Brine springs in *England*, and even of Sea-water; and therefore, tho' it do yield a true marine Salt upon exhalation, it would require too great an expence of fuel to produce it.

The taste of this water is exactly that of a strong solution of Sea-salt, and the comparative specific Gravity by the Hydrometre was as I have described in the last Section.

This water exhibited a gross white cloud and sediment with solution of Salt of Tartar and Spirit of *Sa Ammoniac*, a stiff curd and white sediment with solution of Silver, a white grumescence and cloud with solution of Sugar of Lead.

It made some little ebullition with Oil of Vitriol, none with Vinegar.

It turned wheyish both with Galls and Sumach, deep red with Logwood, of the colour of *Lotura carnum* with Brazil: It exhibited a blue circle at the surface with Ash bark, and a brown amber-colour with Rhubarb.

The Analysis.

A GALLON yielded two ounces, and thirty six grains of sediment, so that it is nearly of the strength of *Leaminton* and *Harrigate* waters, but above double the strength of the water of *Kilroot*, and much stronger than several of the *English* Salino-Nitrous springs.

The sediment above mentioned has the intire taste, and other appearances of marine Salt, v. g. it excited
a great

a great ebullition, and acid fume with Oil of Vitriol, and crackled and fled on the red hot iron :

It did not turn green, but red at the edges with Syrup of Violets, an argument of more acid than in most of the Salts impregnating the saline waters of this Book.

Mixed with the Blood flowing from the veins, this became remarkably more florid than was the Blood flowing from the same veins unmixed.

It left in the filtre an inconsiderable proportion of *indissoluble* matter.

As to the *Operation* and *Virtues*, I am not informed of any medicinal use it has yet been applied to : but undoubtedly it might be advantageously used for the same purposes as other saline waters alike impregnated, such as *Leamington*, *Rougham* or *Cartmall*, *Witber Slack*, &c. of which I have given an account in my general History of Mineral waters.

S E C T. III.

KILROOT Water

IS situated in the parish of *Kilroot*, between *Carrickfergus* and *Castle-Dobbs* in the county of *Antrim*.

It is of a very brackish taste :

It curdled with Soap, and exhibited a white grumous cloud with solution of Salt of Tartar, a white incrustation on the sides of the glass with Spirit of *Sal Ammoniac*, a subtile white cloud with solution of Sugar of Lead, a gross white cloud with solution of Silver, and withal the upper part of the mixture was next morning of a light blue colour :

Oil of Vitriol made but a very minute ebullition with it, and Spirit of Salt less :

Milk boyled with equal parts of it was curdled, tho' not with a clear whey.

With Syrup of Violets it struck a light green :
with

with Logwood red, with Brazil a very dilute red, with Rhubarb a brown amber-colour, with Ash-bark a light blue viewed in a side-position; with Galls little tincture, with Sumach greenish:

It did not redden Beef.

The Analysis.

A GALLON yielded a little less proportion of sediment than our *Francis-street* water, viz. six drams and two scruples, which was white, of a brackish taste, like marine Salt, excited a strong ebullition and acid fume with Oil of Vitriol, but no ebullition with Vinegar:

It turned slowly of a pale green with Syrup of Violets:

It grew moist in the air:

It crackled and fled on the red hot iron:

The solution of a dram of it in a pint of distilled water is brackish, and bitter in the throat; it precipitates a large white grumous sediment with solution of Salt of Tartar, which solution also exhibited a whiteness with the said solution of this Salt diluted with four times as much common water; it exhibits a gross white grumous sediment with solution of Silver; it yields no tincture with Galls, Sumach nor Syrup of Violets; it left in the filtre an inconsiderable quantity of indissoluble matter:

Having been evaporated to dryness, it soon after liquified in the air.

Corol. From the taste of the above solution, from the appearance of it, and the water it self, with Alkalies, and with solution of Silver; from the water's curdling Milk and greening with Sumach, I conclude here is a combination of Nitre or Bittern with the marine Salt; and indeed this was confirmed by the figure of some of the Crystals and their cool, bitter taste.

The Operation of this water seems to be purgative and

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Se^{ct}. IV. *Of the purging Waters.*

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and diuretic ; for three pints and four ounces gave me in the space of two hours four large stools, with little gripes and plenty of urine.

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S E C T. IV.

MAHEREBEG Spring

IS situated at *Maherebeg* in the barony of *Corkaguiny* in the county of *Kerry*, on an arm of the sea near *Brandon-bay*, (from which a ridge of sand hills only divides it) where springs out of a clean white sand, a salt and bitterish water ; by removing the sand with a hand or shovel it may be made as deep as one pleases.

It rises a little below high-water mark, so that every Tide covers it. Dr. *Collis* went to the spot to observe this spring, and watching it constantly from the very first ebb of the tide to its return over it again, he could not find the least variation in it at any time ; he also observed it by the Hydrometre to be a little, tho' but a little lighter than sea-water, that instrument in this water standing at 1. 0. which in sea-water stood at 0. 0. or rather the sea-water stood a little below the uppermost convex part of the globe, when in distilled Nat. and civil Hist. of the C. of *Kerry*. water the same Hydrometre stood at 5. 0. and *Charles Smith* obtained only two drams and a scruple of Salt from a quart of this water.

Since then this water suffers no change at all from the highest tide to the lowest ebb, whereas the salt waters which communicate with the sea rise and fall with the tides ; and 2^{dly}, since it manifests a bitterish as well as a saline taste ; and 3^{dly}, since its specific Gravity is considerably less than that of the Sea-water near it, I conclude that this spring does not owe its origin to, nor communicate with the Sea, but whereas, as it is certain that there are several fresh-water springs which have no communication with the Sea, only so far as to be covered by the Sea-water at every tide,

tide, of which there is an instance also here, (*viz.* of a fresh spring not many yards distant from the other salt one) on the other hand, this is a Salino-nitrous spring arising below high-water-mark, and not owing its origin to the Sea: to all which agrees another experiment, that altho' this water be considerably weaker than Sea-water, even not a quarter of the strength of Sea-water, it curdles Milk when boiled with equal parts of it.

*Brownrig
of Sea-water.*

That such Saline springs there are is allowed by the best writers, and this is assigned as one cause of the different saltness of the Sea in different places, *viz.* the different quantities of salt it receives from Saline springs and rivers: and *Polybius*, cited by Dr. *Peter* in his Treatise of *Dulwich* wells, says, that "in the bottom of the *Adriatic* sea, which turns to *Aquileia*, there are seven fountains and six of them are very salt."

As to the *Operation* and *Virtues* of this water, thus much only at present can be affirmed from the testimony of the neighbourhood, and some experiments of the Physician above mentioned, *viz.* that it is a Purgative of considerable strength, being taken from the dose of a pint to a quart, and that it proves Antiscorbutic when properly applied.

S E C T. V.

Salino-Nitrous Waters in DUBLIN

IN my general History of Mineral waters, I have given a minute detail of the Springs of the city of *Dublin*, and shewn them to be generally brackish and laxative in operation; but here are six principal Springs impregnated with so far a greater proportion of saline contents, than the common hard waters as to merit the title of *Purging waters*, which are

1. That at the *Burn's Arms*, 2. The *Pump*. 3. The *Plough*. 4. *Vernon's-head*. 5. The *Wheat-Sheaf*, all in

Francis-

Francis-Street: The sixth in *Thomas-Court* in the liberties of *Thomas-Court* and *Donore*, next door to, and on the *South* side of the *Cburn* in the same city. (a)

The Hydrometre instantly betrayed the superior specific Gravity of these waters compared to distilled water and rain water, and common spring water thus:

In that at the *Pump*, that instrument stood at $2\frac{1}{2}$, when in distilled water equally exposed it stood at $5\frac{1}{2}$.

In that at *Vernon's-Head* at $2\frac{1}{2}$, when in distilled water a like exposed it stood at $5\frac{1}{2}$.

In that at the *Wheat-Sheaf* at $2\frac{1}{2}$, when in common spring water equally exposed it stood at 5. 0.

In the water at *Thomas-Court* it stood at $6\frac{1}{2}$, when in rain water equally exposed at $8\frac{1}{2}$.

In the water at the *Burn's Arms* in former trials, it stood at 4. 0. when in the waters of the other neighbouring springs in the same street at 5 and 6. 0. (b)

And indeed in repeated trials made in different years, and different seasons of the year before the year 1752. the last named water appeared to be the strongest of the purging waters in *Francis-street*, both by the Hydrometre, and by the greatest quantity of contents it left upon evaporation, but that year it was so far weakened, as to yield scarce half the quantity it used to

(a) Thro' the ignorance of the proprietors this well is lately flopt up: there is a Spring on the opposite side of the street which resembles other hard waters in the city, and curdles with Milk, but it did not yield quite one third part of the contents, as that in the Text did, viz. ninety grains from a gallon, which contents agreed however in quality to those of the other waters here described.

(b) The specific Gravity of any water is extremely variable according to the difference of heat or cold of the weather, at the time of making the experiment: I have therefore thought it sufficient to make a summary comparative estimate of the Gravity of these and other waters, and rain water, spring and distilled water by the ordinary ivory Hydrometre used for trying Spirits, the several waters having been purposely exposed to the same degree of heat.

to do, a difference probably owing to the avarice of some of the rival Proprietors by digging about their respective wells.

These several waters are limpid, except that at the *Wheat-Sheaf*, which is of a straw-colour, and that of *Thomas-Court*, which is yellowish like white wine, or like that of the well of St. *Erasmus* in *Staffordshire*, a water of the same genus.

The taste of these waters is brackish and bitterish; the bitterness becomes more sensible on exhaling some of the aqueous parts:

They all curdle with Soap, and exhibit a white grumous sediment with Oil of Tartar, and a white cloud, and sometimes a white sediment with Spirit of *Sal Ammoniac*.

They give a white grumous sediment with solution of Silver, in some this grume is stiff like cheese; and in the water at *Thomas-Court* it was intermixt with a bluishness:

The five first waters give a white cloud, or else a white grumous sediment with solution of Sugar of Lead: That at *Thomas-Court*, a brownish sediment with that solution, indicating perhaps, in conjunction with the experiment in the last paragraph, some greater admixture of Sulphur in this water.

The solution of Alum gave a white grumous sediment with them all.

Lime-water turned whitish, and gave a whitish sediment with some of them, but far less than the solution of Alum.

All these waters fermented with Acids, both the milder and stronger, and with those of the vegetable as well as mineral class, as Oil and Spirit of Vitrol, Spirit of Salt, Juice of Lemons, Vinegar and *French* white wine: and that at the *Wheat-Sheaf* excited by much the greatest ebullition, and destroyed the acidity of Spirit of Vitriol more than any of them mixed in equal quantities; and accordingly we shall see in the sequel

sequel that this water contains the greatest quantity of calcarious matter; and some of the water at the *Pump* which had been kept a year, made no ebullition with acids, and why? because it had precipitated a considerable part of its terrestrial matter (a).

Milk was coagulated and exhibited a clear whey when boiled with equal parts of every one of these waters, excepting that at the *Wheat-Sheaf*, which produced a white whey, agreeable to its containing less acid, or more absorbent Earth than the others; and in my later experiments made *A. D.* 1753 and 1754. the water of the *Pump*, and that of the *Plough* gave a clear whey, but that at *Burn's Arms* did not curdle the Milk, being weak, and yielding far less contents than it used to do in former years.

Beef steeped and boiled severally in each of these waters was for the most part reddened as from Salt-petre.

Syrup of Violets tinged them all green, and that at the *Wheat-Sheaf* the most deeply, agreeable to its containing a greater quantity of absorbent Earth.

Galls and Sumach turned green with these waters, especially on standing one, two, or three days, the greenness diffusing it self by degrees.

Logwood gave them a deep red, or purple, or crimson.

Rhubarb extracted from that at the *Pump* a much deeper tincture than from pipe-water; from that at the *Burn's Arms* and *Wheat-Sheaf* an orange-colour, from *Thomas-Court* a brown amber.

Ash-bark gave a blue green to the *Pump*, a deep green bluish circle to *Burn's Arms*, a pale blue circle to the *Wheat-Sheaf*.

Cale boils very green in all these waters.

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(a) The same thing is observable also in the *Bristol* water, which having been kept some years, suffered a like change, viz. a separation of the absorbent Earth disengaging it self from the saline parts and falling to the bottom and sides of the bottle, even as Wine by long keeping deposits its Tartar.

The Analysis.

A GALLON of the water at the *Burn's Arms* gave on evaporation in various trials at a *medium* 584 grains, but *A. D.* 1752. it gave only 246 grains of solid contents.

The same quantity of the *Pump* gave at a *medium* 431 grains of solid contents; the same quantity of the water at the *Vernon's-Head*, gave at a *medium* 437 grains; the same quantity of the water at the *Plough* gave at a *medium* 410 grains; the same quantity of that at the *Wheat-Sheaf* gave at a *medium* 368 grains; and the water at *Thomas-Court* at a *medium* 316 grains of solid contents.

A. D. 1753. a gallon of the water at the *Pump*, gave 408 grains of sediment, (and *A. D.* 1754. nearly the same quantity) *A. D.* 1755. 368 grains; that at the *Plough* 376 grains, that at *Vernon's-Head* 336 grains, that at the *Wheat-Sheaf* 208 grains, and that at *Burn's Arms*, which in former years, on repeated trials always yielded the greatest quantity, now yielded the least, viz. only 176 grains, and 1755, 172 grains.

Those solid contents, *residua* or sediments of each of those waters exhibited the following appearances:

The *residuum* of the *Pump* was of a whitish and brown-yellowish colour, of *Vernon's Head*, and the *Wheat Sheaf* yellowish; of *Thomas-Court* brown-yellowish, and gave a yellow tincture to Spirit of wine: this water also threw up a grey and bluish Scum.

The taste of the sediments of all the waters agreed, being pungent and brackish, agreeable to the taste of the predominating Salt.

They all fermented with Acids and generally emitted an acid fume with Oil of Vitriol.

They all turned green with Syrup of Violets, some of a brighter green, and quicker than others: particularly the sediment of the *Wheat-Sheaf* in experiments

ments made in concert with the rest, *A. D.* 1753. turned of the deepest green of them all.

The *residuum* of each of these waters rubbed with *Sal Ammoniac* emits an urinous and pungent smell.

The *residuum* of the *Burn's Arms* when rubbed with Salt of Tartar, gave an urinous smell and *setor*, and the several *residua* of most of the others gave a greasy and somewhat pungent smell with the same Salt, but less than when rubbed with *Sal Ammoniac*.

The sediments of all the waters grew moist in the air, especially that of *Burn's Arms*, which melted in a few hours.

On the red hot iron each of these sediments melted in small blisters, and several of them emitted a smell like *Aqua fortis*. It was rare that they crackled or fled on the red hot iron, but the sediment of *Burn's Arms* in one trial did crackle and fly a little.

There was a very remarkable difference in the products of distillation from two of these waters; for whereas the water first distilled from *Burn's Arms* lathered with Soap, and the last runnings were of a smell like Spirit of Nitre, and of a strong acid taste, turned of a bright red with Syrup of Violets, and curdled Milk, the water distilled from *Thomas-Court* to a dryness by the retort and receiver luted, being examined from time to time was void of all acidity.

I shall next describe the several appearances exhibited distinctly by the several parts into which the sediments aforesaid were resolved, *viz.* the Salts [and Earth, or rather indissoluble matter left in the filtre consisting chiefly of a calcarious and sulphureous matter.]

And first of the Salts.

The Salts impregnating these waters are the principle, to which they chiefly owe their activity and operation; and accordingly, these bear a large proportion to the Earth, *v. g.* in the *Pump* they were to the Earth as 16 to 1, and in other trials as 5 or 6 to 1: in

Burn's Arms as 114 to 8 : in *Thomas-Court* about as 12 to 1 of Earth ; but in the *Wheat-sheaf* the Earth bore the greatest proportion to the Salts, viz. here the Salts were to the Earth but as 4 to 1, and consequently hence appears the reason of this being a more powerful absorbent than the rest.

The Salt in the *Pump* was of a yellowish, whitish colour, in the *Burn's Arms* of a light-brown ; in *Vernon's-Head*, and the *Wheat-sheaf* brown yellowish : in *Thomas-Court* of a deep brown-amber colour.

The taste of the Salts of all these waters was pretty much as above described of the *residua*, viz. brackish and pungent, and in some of them, especially in the solution, a bitterness was evidently joined, the Nitre being here disengaged from the enveloping earth.

The Salts of these waters excited an ebullition and acid fume with Oil of Vitriol, but made little or no ebullition with other acids, so that the Fermentation of the sediments above mentioned with all acids, before the saline parts were separated from the terrestrial, was owing to these last.

Hence appears 1. the genuine nature of these Salts, viz. that they are in a great measure marine Salt, whose peculiar property is to ferment and emit an acid fume with Oil of Vitriol. 2. the essential difference between these Salts and those of *Poubon*, *Gerousterre*, and others which ferment with all acids, even that mild one Vinegar : But to proceed,

The solutions of the Salts of these waters gave a white grumous sediment with Oil of Tartar.

The solution of the Salt of the *Pump* instantly exhibited white curds with the solution of Silver.

The Salts of these waters added to Milk and boiled in the proportion of half a dram to half a pint curdled it, some with a more clear, others with a less clear whey :

They

They turned green with Syrup of Violets, but the green was considerably more weak and more slowly struck than in the sediments before the separation of the terrestrial parts, shewing that these have a great share in producing this effect; and here again appears another Criterion of the strongly alkaline quality of the *Natron* in the *Poubon* and other springs, viz. which both strikes a deeper green, and this more quickly than the Salts of these waters.

The solutions of the Salts of these waters produced no greenness with Galls nor Sumach, notwithstanding that the waters themselves (in which the Salt and Earth are united) did:

The solution of the Salt of *Burn's-Arms* struck a purple with Logwood.

Rhubarb tinged the solution of the Salt of the *Burn's-Arms* of a brown-amber, the solution of the Salt of the *Pump* yellow, the solution of the Salt of *Vernon's-Head* yellow tending to brown amber:

Ash-bark gave nothing of a blue circle to the solution of the Salt of the *Pump*, but it gave a greenness at the surface to a solution of the Salt of the *Burn's-Arms*, and a very dilute blue circle to the solution of the Salt of *Vernon's-Head*.

Scholium. Here again appears further the intermediate nature of these Salts between Acid and Alkali, the first destroying most of these tinctures, whilst Alkalies strike them much deeper than these Salts do.

The Salts of these waters grow moist, and melt in the air; and that from the *Pump* and from *Burn's-Arms* melted, even in my pocket.

On the red hot iron these Salts melted in small blisters, scarce any of them crackled, except the *deliquium* of the Salt of *Thomas-Court* dried: The like observation occurs above on the sediments tried on the red hot iron, notwithstanding other indisputable evidences of marine Salt.

On the red hot iron the Salt of the *Pump* emitted acid fumes and stunk, and that of *Thomas-Court* smell'd like *Aqua fortis*.

I tried the proportion of water requisite to dissolve several of these Salts, and found that of the *Pump* required sixteen times its own weight of water to dissolve it, that of the *Vernon's-Head* above sixteen times its own weight, and that of *Thomas-Court* above twelve times its own weight.

The following trials with *Sal Ammoniac* and Salt of Tartar seem to indicate some combination of *Natron* with some of these Salts and encourage further enquiry.

The Salt of *Burn's-Arms* rubbed with *Sal Ammoniac* emitted a pungent and urinous smell, and so did the Salt of the *Wheat-Sheaf*, which last also emitted a pungent and fetid smell when rubbed with Salt of Tartar; in like manner the Salt of *Thomas-Court* emitted a pungent urinous smell rubbed with *Sal Ammoniac*, and a pungent and fetid smell with Salt of Tartar.

The Figures of the Crystals of the Salt of the *Pump* were chiefly cubical, with but a few of the oblong or Nitrous kind: Those of the *Burn's-Arms* were also cubical with some long Nitre-like *Stiria* interspersed; I also obtained some long Nitre-like Crystals from the Salt of the *Wheat-Sheaf*, and from that of *Thomas-Court*, partly cubical, and partly long quadrangular or Nitrous ones; and that such is truly the composition of the Salts impregnating these waters may further appear from the following observations:

When the Salt of the *Pump* had been exposed some months in a closet, it had attracted above its own weight of moisture from the air, which solution *per deliquium* had much of the taste of common Brine, and made a considerable ebullition, and emitted a penetrating fume with Oil of Vitriol, and turned of a grass-green with Syrup of Violets, and being exhaled to a pellicle

pellicle gave Crystals of a cubical figure, besides some long quadrilateral ones, or of the Nitrous kind, tho' but few, and perhaps it was from this combination that this solution reddened flesh-meat, viz. from the Nitre or Bittern.

Those cubical Crystals answered to marine Salt and were distinguished from calcarious Nitre by the following appearances. 1. By the saline taste. 2. They crackled and fled on the red hot iron. 3. The solution of half a dram of these crystals in half a pint of distilled water precipitated a gross curd with solution of Silver, (as the solution of marine Salt always does, even tho' much weaker) but it did not whiten with the solution of Pot-ashes, as the solution of calcarious Nitre always does. 4. Half a dram did not curdle half a pint of Milk as that proportion of calcarious Nitre always does.

The remainder of the above *Deliquium* in the air, viz. what was left undissolved in the air, yields a nauseously bitter Salt, which does not (as the former) ferment with Oil of Vitriol, nor turn green with Syrup of Violets but very slowly, and less deeply than the *Deliquium* did.

The solution of the said Remainder reddened Beef and Mutton, and turned greenish with Galls, the characteristics of calcarious Nitre, whereas the *Deliquium* it self, tho' much more strongly saturated, exhibited no tincture with Galls, but its own deep amber-colour; from all which it abundantly appears that these are two different Salts: nevertheless twenty-three grains of the aforesaid bitter Salt in two drams of distilled water being laid by in a cupboard near the fire exhibited Crystals perfectly cubical, having but few of the oblong or Nitrous kind interspersed: hence appears the close connexion of these two Salts, and how difficult it is to separate them, and that the marine Salt in this composition predominates over the Nitre.

I made the same experiments with the same events on the Remainder of the *Deliquium* in the air of the Salt of *Thomas-Court*, from whence and other concurring observations, it was abundantly confirmed, that the composition of Salts here mentioned prevails in the waters of the neighbourhood.

Before I conclude my account of the Salts of these waters, it will not be useless to observe, that two drams of the Salt of *Burn's-Arms* gave two or three stools expeditiously and without gripes, even after the manner of the operation of the water it self.

It remains in the last place that some account be given of the Earth, or rather indissoluble parts of the *residuum* of these waters, left in the filtre after the separation of the Salts.

That this is not merely calcarious, appears from hence, that this matter in divers trials obtained from several of these waters being dried, sparkled on the red hot iron; and thereby lost nearly one half of its weight, and in one experiment flamed, shewing something Sulphureous: but that it is chiefly a calcarious or sparry matter appeared from hence: it fermented greatly with all Acids, turned greenish with Syrup of Violets, and upon calcination (in different trials on the several Earths of the different waters) acquired the taste of Lime, turned red or yellow with the Solution of Mercury sublimate corrosive, and emitted a pungent smell rubbed with *Sal Ammoniac*.

These appearances generally arose with the Earths of these waters, excepting that of the *Burn's Arms* which had this singularity, that upon three hours, and even eleven hours calcination, it did not give the taste of Lime to water, nor a yellow nor red tincture with the solution of Mercury sublimate corrosive in water; so that the Earth in this water should seem to be of a different kind from that in the rest, to which agrees well enough the observation of its last runnings in distillation, being strongly acid, otherwise

otherwise than those of *Thomas-Court*, which were void of all acidity.

Corol. 1. The several purging Springs in the city of *Dublin* are of different degrees of strength according to the different quantities of saline contents, which have varied from 246 to 584 grains in each gallon.

2. All these waters are adapted to sweeten Acidities, and that of the *Wheat-Sheaf* most, as containing the greatest proportion of calcarious matter.

3. Some admixture of *Natron* appears in some of them from the pungent and urinous smell excited by rubbing the *residua* and Salts of several of them with *Sal Ammoniac*; and the pungency and *fetor* excited by rubbing with Salt of Tartar indicates the same thing, and perhaps also an admixture of Sulphur.

4. The natural composition of the Saline contents, *viz.* an union of a calcarious Earth with an Acid, is strongly hinted by the acid vapor expelled from thence by the red hot iron, compared with the calcarious nature of the Earth.

5. In order to a clear demonstration of the principal predominating minerals in these waters it will be necessary to sum up in one view the several evidences of the presence of each in these waters.

1st, The marine Salt appears from the brackish taste of most of them, from the grumous sediment they exhibit with solution of Silver, from the fermentation and acid fume which their *residua* and Salts excite with Oil of Vitriol, tho' not with other Acids, from the *residua* and Salts moistening and melting in the air, from the *residua* and Salts crackling and flying on the red hot iron; altho' this frequently fails, probably by reason of the Salts being too dry or enveloped with other minerals; and lastly from the cubical figure of the Crystals.

2^{dly}, The calcarious Nitre is demonstrated in these waters by the bitter taste combined with the saline or

brackish, frequently manifest in the waters themselves, but especially on exhaling them for a while, and in the solutions of their Salts; by the waters themselves generally reddening Beef or Mutton infused and boiled in them, and the Salts also having the same effect; by the waters themselves and their Salts curdling Milk much more strongly, than Sea-salt or a solution of it of equal strength does; by the *residua*, and Salts melting in blisters on the red hot iron as calcarious Nitre; by the green tincture given to the waters by Galls and Sumach; and lastly by the oblong figure of the Crystals interspersed among the cubical ones.

3dly, That these waters are also impregnated with a calcarious matter joined to something sulphureous appears by the examination of the Remainder in the filtre after the separation of the Salts above given.

The water of *Thomas-Court*, particularly seems to betray more of the Sulphureous mixture by the following appearances jointly considered, *viz.* by the yellowish colour of the water, by the bluish colour intermixt with the Sediment precipitated from the water by the solution of Silver, and the brownish colour in the sediment precipitated from it by solution of Sugar of Lead, by the Sediment of this water giving a yellow tincture to Spirit of wine, and by the *residuum* left in the filtre after the separation of the Salts flaming on the red hot iron:

And indeed the sulphureous Acid and calcarious Earth seem plainly to be the minerals which by their union constitute the *Sal medium* impregnating these waters; which that they do really contain an Acid, appears not only by the action of the fire upon their *residua*, which thereupon emit an acid smell like *Aqua fortis*, and the last runnings of the *Burn's Arms* water were of an acid smell and taste, but also from the coagulating effect which the waters themselves have on Soap and Milk, the first a more touchy test of an Acid, than the last; and from the waters in exhaling, cor-

roding

roding common glazed vessels, as the Vitriolic acid is known to do; and to conclude,

The genuine nature of the Acid and Earth in the *Burn's Arms* water appeared in the following experiment:

The *residuum* of that water was mixed with equal parts of common water, and Oil of Vitriol, and distilled in a Retort, as in the process for making the *Spiritus Salis Glauberi*:

It yielded a green Spirit, smelling like Spirit of Nitre, and strongly acid to the taste, and which being poured on Gold, presently acquired a yellow tincture, as Spirit of Salt (the only proper acid menstruum for dissolving Gold) does: it made a strong ebullition with Alkalies, but none at all with common Salt, and so is quite different from Oil of Vitriol, being indeed an acid Spirit, partly like what is yielded by Nitre, and partly like Spirit of Salt.

Accordingly, the *residuum* in the Retort was strongly acid, and being dissolved, filtered and crystallized, yielded a Salt of a nauseous bitter taste, like *Glauber's* Salt, being indeed the Oil of Vitriol united to the terrestrial matter of the *residuum* of this water, whilst the Acid of the same *residuum* is expelled and driven over into the Receiver.

From hence appears the reason of that common phenomenon arising on the mixture of Oil of Vitriol, and the Salts of these waters, *viz.* an ebullition and acid fume, the ebullition proceeding from the terrestrial matter in the Salt attracting the Oil of Vitriol more strongly than its own Acid, which last is therefore expelled in the form of vapour, being a true Spirit of Salt.

*Of the Operation and Virtues of the Francis-Street
WATERS.*

These waters were drank medicinally in the latter end of the last Century, and their use has been again
of

of late revived on occasion of the labours of the *Physico-historical Society*; and tho' no account has yet been published of them, they are not less worthy the notice of our people, than those in the neighbourhood of *London* are of theirs, some of which formerly were imported hither, whereas ours are more strongly impregnated than several of them, and have recommended themselves by numerous trials of their easy and quick operation and good effects, as will abundantly appear by the sequel.

The Springs rise at the bottom of a yellow Clay.

That at *Vernon's Head* seven feet six inches, that at the *Pump* six feet from the surface of the ground: Now as these Springs are situated nearly in the highest part of the City, which from observations made with the Barometre, appears to be more than sixty feet perpendicular from the level of the Sea, it is evident, that the Sea can have no communication with these Springs, as some have imagined from the situation of *Dublin* near the Sea-coast, but that they are supplied by Salts lodged in the *Strata* of the Earth, as in other saline Springs situated in places remote from the Sea, and described in my general History of Mineral waters; and most of the brackish Springs with which this city abounds, appear to be of the same origin, rising at various depths; but commonly from fourteen to forty feet from the surface of the Earth, *i. e.* a good deal higher than the level of the Sea.

The water is a mild and expeditious Purge, in the dose of four, five or six pints, ordinarily procuring five or six stools, without gripes, faintness or dejection of Spirits, an advantage attending divers or most of the saline and nitrous waters, which gives them in many cases the preference to the Catharticks of the shops. It also operates by urine, and in summer-time has been observed to pass off partly by a breathing sweat. Some have taken it to four quarts, and some

to

to ten or twelve, without any other notable consequence than a very large evacuation by stool.

From the principles above laid down it is obvious to conclude that it must not only dilute, but attenuate viscid humours and correct acid ones in the Stomach and Guts, and carry them off.

In foul Stomachs it sometimes vomits.

It is remarkable for producing a soreness in *Ano*, an effect common to divers other of the purging waters, as *Aston*, &c. and therefore where too great an irritation of these parts is to be feared, requires caution, and the whey of it may be given in such case.

It frequently throws out Pimples on the skin, and heals them afterwards:

It frequently purges those who have not been moved by other purges:

It leaves a somewhat disagreeable relish in the mouth, and sometimes raises a little thirst, the chief inconvenience I have observed attending its use: however it seems to be generally cooling in operation, of which besides the particular account of its virtues in the sequel, I remember an instance in an excoriation of the urinary passages with a discharge of mucus and blood, and an hectic disposition, where, taken in the small dose of a quart in a day, it lessened the discharge and the hectic heat, the marine Salt in this water being greatly diluted, and also tempered with a Nitre.

It is commonly taken a little warm; and *Glauber's Salt* is frequently dissolved in the first draught, which both quickens the operation, renders it more cooling and approaching nearer in quality to the *Epsom* and *Scarborough* purging waters; and if *Sal polychrest* be dissolved in it, which is a Salt very congruous to its own, it also quickens the operation of the water, and renders a less quantity of it necessary, so that a quart or three pints with two drams of *Sal polychrest* may be sufficient.

A Whey

A Whey made of it boiled with equal parts of Milk is commodiously taken to promote the operation of other physick.

This water may also be conveniently taken, as *Musgrave* orders, mixt with any of our domestic Chalybeate waters, or with the *German Spaw*, whereby an extemporaneous purging Chalybeate water is made, resembling the *Scarborough* purging Chalybeate, with this advantage, that in this mixture the Chalybeate principle is in its full strength, which in the *Scarborough* water transported to remote places becomes effete.

The Virtues of this water from observation are chiefly as follows:

It strengthens the stomach, and is eminent in restoring lost Appetite, especially in stomachs debauched by the use of spirituous liquors.

An obstinate Vomiting resisting the common remedies, was cured by daily drinking four pints of it boiled down to a quart.

A labouring man, aged thirty, had been for a quarter of a year infested with a very troublesome Heartburn, with sour belches, vomiting a green water, a costive belly, and loss of Appetite; On taking four pints of this water for a dose, with half an ounce of *Glauber's Salt*, and repeated every second day to four times, he was greatly relieved.

A man aged fifty, had for three months been troubled with flatulent pains of the stomach with a sense as it were of dilaceration, together with loss of appetite, vomiting of his food and dejection of spirits:

I ordered the *Pill. gummosæ* with temporary relief; but the pain returned as severe as before. I therefore recommended the use of these waters warmed (it being winter) to the quantity of four pints, with half an ounce of *Glauber's Salt*, and to be poured on a little Caraway-seeds, to be taken first twice a week for three or four weeks, and then once a week, where-

upon

upon his Pain was greatly abated, his vomiting in a great measure ceased, and his appetite returned.

It has been observed to expel the Worms, particularly the Tape-worm, one of which thirty-six inches, another fifty-five inches long, were discharged upon the use of it.

In Colic pains, whether bilious, flatulent or nephritic, it has had good effects: of the flatulent sort, several instances occurred, which were removed by it, even taken cold; and the good effects of its use in the following case gave it no small credit:

A man aged about thirty-six, hypochondriacal and flatulent, very negligent of a due regimen in his diet, was subject to frequent returns of the Colic with bilious vomitings commonly succeeding a costive belly, and attended with a less free discharge of urine, and this deeply saturated: he fell into an entire loss of Appetite, and had a whiteness on his tongue in the morning:

It was observable that his Colic pains were frequently succeeded by a Pain and Stupor in the Limbs, whereupon his stomach became remarkably easier, and *vice versa* his Limbs were easy whilst his stomach was affected. I ordered him six drams of *Glauber's Salt* in four pints of *Francis-street* water for a dose, to be repeated every third day for six times, and then to continue its use once a week.

He soon recovered his Appetite, his tongue became clean, and he mended in all respects, without any other assistance, except a few drops of *Elix. Vitrioli*, *Tinctura flor. Martialis*. and *Tinctura amara*.

The following is a notable instance of the powerful effects of this water in dissipating flatulent tumors in the belly:

May 16, 1748. A woman aged thirty-six, of weak bowels and subject to the Colic, had for the space of four months a pain in the region of the *hypogastrium*, and

and for six weeks now past, a large circumscribed tumor in the middle part of that region, with perpetual pains like those of labour, a great difficulty both of making water and discharging wind from the *anus*, by reason of the compression of both the bladder and *rectum* by the tumor of the *uterus*.

I ordered her the *Francis-street* water with *Manna* and *Glauber's* Salt to be repeated every fourth day and an opiate at night; from whence the pains became more diffused and less fixed.

May 28. I gave her the Tinctures of *Asa fetida* and *Castor* between whiles, but bad her still persist in the use of the water as before, which she did until she had taken eight doses.

June 22. Hereupon the Tumor, as it were miraculously vanished, (which was owing however to a prodigious discharge of wind by the *anus*) all pain ceased, and she had freedom of making water.

I ordered her to proceed in the use of the water once a week during the summer, and she continued well until next autumn and winter, when the Tumor returned; but it disappeared again on the repeated use of the water, and taking the Gum Pills.

A. D. 1749. May 13, she had some return of the Tumor, and repeated the water with a diminution of her pains, and a subsidence of the Tumor.

Thus the rapidity of the progress of the disease was check'd, and ease was procured for a considerable space of time; but as all this inflation was only symptomatical, tho' great relief was procured by the temporary dissipation of the Tumor by means of the water, the cure could not be radical: for the disease being seated in the *Uterus* ended in an Ulcer hereof, (as appeared by the discharges) which put an end to her Life the next *December*.

It is said that a physician of the first rank used formerly to prescribe these waters in excesses of Cholera and in the Jaundice, which corresponds to *Allen's* Observation

servation of the good effects of Waters impregnated with a Salt like marine Salt in the Jaundice, and Sydenham's practice in ordering four pints of the purging mineral waters every morning, after a dose of a Chalybeate Electuary in the same disease. I have indeed no particular Observations on the use of these waters in this disorder, but from their principles there seems ground to conjecture, that they must be useful when it is (as most frequently happens) attended with a viscid Bile and a costive Belly, or with calculous concretions in the biliary ducts, which it is probable, as an attenuating as well as diluting medicine, they may considerably contribute to dissolve and expel, especially when joined to saponaceous medicines.

Next, these waters are of great service in cleansing the bladder and kidneys from Gravel, Sand or viscous humours; are useful in Nephritic pains, especially where bleeding has been premised and the stone is not too large to pass; but without a due attention to the circumstances of the case their use may be dangerous, as in the following memorable instance.

A middle aged man and sanguine, having been frequently troubled with nephritic paroxysms and voided Gravel, and frequently used these waters with relief, at length fell into the like nephritic pains attended with a fever; whereupon he instantly had recourse to his usual remedy, these waters, but not with the usual success; for he fell from thence into a total suppression of Urine, lasting three days, which was cured by bleeding:

In this case doubtless the Suppression was promoted at least by taking these waters improperly and without advice, in a full and inflammatory state without any previous evacuation, and accordingly bleeding at length removed the Suppression.

Of its efficacy in the Gravel and in Worms the following is an instance:

A certain

A certain person had been troubled with the Gravel from his childhood, and from thence a Suppression of urine so great, as to be frequently obliged to suffer the Catheter to be pass'd; at the age of nineteen he moreover fell into an entire loss of Appetite, and began to drink the *Francis-street* water, in the dose of a quart, three pints, and sometimes four, dissolving *Glauber's Salt* in it, and persisted in the use of it for a quarter of a year, during which time, he pass'd an incredible number of small stones and gravel, and withal, discharged a Tape-worm of prodigious length. He remained free from all complaints ever since, even to the 50th year of his age, *A. D.* 1747.

Nor is the efficacy of these waters confined to the *primæ viæ* and urinary passages, but extended also to the remoter stages of the circulation:

A man aged forty-eight exposed to the inclemency of the weather in a cold shop, was suddenly seized with a beginning Palsey in the tongue; his speech became very indistinct, and the motion of his limbs failed much.

He began the use of the water in summer, *A. D.* 1748. drank it warm, and sometimes with *Glauber's Salt*, and in a large dose, sometimes to five or six quarts at a time, and on three or four doses finding himself better, continued its use, sometimes once, sometimes twice a week during the summer, and *A. D.* 1749, was pretty well recovered (a).

Several instances are also given of its curing sore Eyes, and Ulcers of the legs, some of them inveterate.

It

(a) In the Palsey consequent upon bilious colics in hot and bilious habits, the *Alford* water (one of the *Nitroso-saline*) is ordered with excellent effect, and the *German Spaw*, and the *Bristol* waters are of great use according to *Musgrave* and *Pierce*:

But as our water is chiefly a weak brine of marine Salt, perhaps in the case here referred to, it might exert some degree of a potentially drying and warming operation; and the rather, as sea-water drank is found to have good effects in some paralytic cases.

It has been of service in Gonorrhœa's, and in a certain *Fluor albus* attended with that degree of acrimony as to have given suspicion of a beginning Cancer of the womb, the long continued use of these waters was of great service (a)

And here it may not be impertinent to subjoyn the following case.

November 23, 1753. In a woman aged thirty, after a laborious birth, and not improbably some contusion on the use of chirurgical instruments in her delivery, about half a year ago, a hard Tumor at the neck of the womb was first perceived, which was very painful upon standing, walking, the motion of a Chaise, or catching cold, and sometimes hindred both her making water and going to stool, and she was grown big as with child.

After a severe Fever in *December*, the swelling of her belly partly subsided, but the hard Tumor above mentioned still continued, nor could she bear to walk but very gently, for pain.

April 26, 1754. After a larger menstrual discharge than usual, and besides that, another discharge of a black, fetid matter every day, she was able to bear walking better than before, but was weak and emaciated.

In *August*, the Tumor still continued, and she could not bear walking for pain. I advised her to take the *Francis-street* water to three pints for a dose, and a quarter of an ounce of *Glauber's Salt* in the first draught,

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(a) It may be worth the Reader's while to have recourse to my account of the *Lambeth* water near *London* commonly known by the name of the *Dog and Duck* water, in my general History of Mineral waters, where he will find a minute and authentic account of the good effects of this last mentioned water in Cancerous dispositions, which may serve as some confirmation of the hint here given of the virtues of our *Francis-Street* water in some of these cases, and the rather because both these waters yield the same principles on their *Analysis*, with this difference only, that the *Lambeth* water carries but half the proportion of the same Mineral that the *Francis-Street* water does,

draught, and to repeat it once in a week or ten days as her strength should permit.

Accordingly she persisted in this course for three months with very great relief. It purged her pretty smartly, altho' but a very moderate dose: she however, tho' weak and hysterical, bore it well: and when I visited her the following *December*, I found that she was quite free from pain, which she had not been for several months before, but now could bear walking above a mile without pain: (as she could also three months after) I ordered her to persist in the use of the same medicine, she being still big, tho' not pregnant: and in the year 1756. during the summer season, she drank a pint of Sea water (a saline purging water also, like this, but stronger) twice a week, and in the winter once a week, and grew lanker on it, and could bear considerable exercise without any pain or inconveniency.

It may indeed be doubted whether this cure be any more than palliative, nor does a Cancer appear to have been formed here, tho' very possibly it might have ended in one: however here was a notable respite procured to the miseries of a patient in a very forlorn case by the use of these waters, which may give a hint to the sagacious for a further application of them; and lastly,

This water is in considerable repute for its good effects in removing obstinate Pustules of the skin, both inflammatory, watry, and divers of them attended with great itching and heat, and resisting the common remedies, and in some of the more stubborn of these cases the waters were long continued, *v. g.* all summer, and even throughout the winter, being taken warm. (a)

January 11, 1755. A young man aged twenty-two, of a tabid extraction, laboured under an inveterate Itch, attended with large scabs, and an unusually large discharge

(a) We may now learn to shake off our prejudices against the use of the saline waters in these cases, since even sea water, a much more

discharge in several places, even so great as to threaten him with a Consumption; for he fell into great weakness, night sweats, thirst, and loss of appetite, and the Pustules still continued to break forth afresh, notwithstanding he had applied Sulphur externally.

I thought it proper to trust to the use of Internals alone, and ordered him a quart of *Francis-street* water to be taken warm, dissolving an ounce of the *Sal catharticus Glauberi* in the first half pint, and to repeat this cathartic twice a week. It purged him very agreeably, took away the itching and eruption, quenched his thirst, stopt his sweats, and restored his appetite on taking four doses only.

So much from observation and experience concerning the uses and virtues of *Francis-street* waters; for a further illustration of which, and for a more extensive application of them to the purposes of medicine, the reader may have recourse to the general account of the virtues of the Saline waters, and to the particular histories of the *Dulwich* and other waters of this Class, and to the Chapter of Sea-water, in my *general History of mineral waters*, the uses of which last in medicine, have within these few years been amply investigated, our *Francis-street* water being chiefly a saline one, but much less saturated than Sea-water, and consequently safer in several cases, where there may be fear of mischief from too great acrimony.

The Comparison of the Waters of Francis-street to divers of the foreign Waters.

1. In the quantity of saline contents they resemble the waters of *Epsom* and *Aston*, but differ from them in quality thus: in those of *Epsom* and *Aston*, the Nitre predominates over the marine Salt, but in the *Francis-street*, the marine Salt predominates over the Nitre.

2. As to the quality of the contents, the *Francis-*

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Street

more strongly impregnated one than these waters, is by the evidence of late experiments, acknowledged frequently to prove effectual in the cure of some of the most obstinate cutaneous diseases.

Street waters very nearly resemble those of *Dulwich*, *Stretbam*, and the *Dog* and *Duck* near *London*, in which also the marine Salt predominates over the Nitre; but the *Francis-Street* water is above double the strength of *Dulwich* and *Stretbam*, and double the strength of the *Dog* and *Duck* water.

3. The *Fons Hornbusanus* in *Germany* described among the Salino-Nitrous waters in my *general History of mineral Waters* nearly resembles our *Francis-Street* waters both in the nature of the impregnating Salts, and in the dose, operation and virtues; and in the
Decur. 2. *Ephemerides Germanicæ*, we have an account of a Nobleman of *Austria* terribly afflicted with the Epilepsy, who by drinking plentifully of these waters, discharged by stool an animal like a Lizard, and from that time was happily freed from the paroxysms.
Ann. 10.
Obs. 166.

The *Aqua d' Availles* in *Pontou* described by *Duclos*, contains also the same kind of Salt, but in not much above half the quantity.

N. B. As I have above hinted my suspicion of a late difference in the strength of some of the purging springs in *Francis-street*, and particularly that of *Burn's-Arms*, to have been owing to digging about them, there seems by this means to have been admitted some little mixture of common water into some of the original mineral springs, by which means they have been weakened, and therefore some of them yield less contents than they formerly did, altho' still enough to give them a purgative quality, and to recommend them as a commodious, mild, expeditious and useful Cathartic, when properly prescribed to the numerous Invalids in this populous city; and this present *April* 1757. I find the proportions of Contents in a gallon of the several springs to be as follows:

Pump, Gr. 340. *Vernon's-head*. Gr. 323, or more.
Plough, Gr. 253. *Wheat-sheaf*, Gr. 224. *Burn's-Arms*, Gr. 182.

S E C T.

S E C T. VI.

GALWAY Water.

A. D. 1751. I received from Dr. *Ambrose Lynch* of *Galway*, a water evidently reducible to this Class.

It was bottled with the utmost care *June 27*, at three in the morning, and arrived in *Dublin July 4*, at three in the afternoon.

It is a perennial spring and well supplied, situated near the East-gate of the town of *Galway*, twenty feet below the level of the street.

Its taste and smell at the spring, where the above mentioned physician examined it, is chiefly ferruginous; where also a little fresh powder of Galls put into it gave instantly a deep purple colour: On its arrival in *Dublin*, at the distance of time before mentioned, some of the bottles did still retain their ferruginous taste, altho' weak, and gave a pale pink-colour with Galls, and next morning precipitated some purplish coloured grumes; and several of the bottles emitted an elastic vapor, especially one that smell'd musty, and had the ferruginous taste, and struck the deepest pink-colour with Galls, having undergone a fermentation; but some others of the bottles had lost the ferruginous taste, and gave no tincture with Galls.

These experiments shew, that it is one of those Chalybeates, which I have elsewhere called those of the second class; but I have placed it here, because it is compounded of other minerals; for it made a violent ebullition with Spirit of Vitriol, even when it had been opened five days, and it curdled greatly with Soap before it lathered, tho' boiled with Milk, it exhibited no coagulation: Syrup of Violets turned it greenish; and Galls turned the water which had lost the ferruginous quality, wheyish, and on two days standing, exhibited a greenish amber at the surface, which in four days descended to half the depth of the glass, and in six days descended quite to the bottom, arguments of a salt, and earth, whose nature will appear by

The Analysis.

DURING the evaporation, it soon yielded a thick Scum, and white crust on the sides of the pan, and in one Specimen the proportion of a gallon yielded 128 grains, in another 104 grains of Sediment, of a pale yellow colour, from the mixture of the Ochre and calcarious matter: it made great ebullition both with the Oil and Spirit of Vitriol, and with the first excited an acid fume, which, as well as moistning in the air greatly, even in summer-time, shews a marine Salt, to which it's brackish taste also agrees, tho' not without a mixture of the nauseous bitterishness indicating a Nitre combined with it; and it lay quiet on the red hot iron.

Some of the preceding, added to the following experiments, shew a native Alkali like the *Egyptian Natron* in this Sediment, which being rubbed with Syrup of Violets soon turns of a bright green, and on standing all night, of a deep grass green; rubbed with *Sal Ammoniac* it smell'd strongly pungent and urinous, and a little pungent with Salt of Tartar.

The Salt separated from the indissoluble matter (of which last, I obtained twenty grains from seventy-six of Sediment) is of a pale yellowish brown colour, and agreed in taste, and in exhibiting the very same appearances with Syrup of Violets, *Sal Ammoniacum*, and *Sal Tartari*, and in growing damp in the air as the *residuum* in gross did, as above described; but the pure Salt thus disengaged from its terrestrial matter, melted on the red hot iron with a strong smell, and made no ebullition with Spirit of Vitriol: moreover half a dram of it curdled half a pint of Milk, and Beef boiled in a strong solution of it in distilled water, was reddened a little at the edges.

The Solution of the Salt exhaled low down, and laid by exhibited fair cubical Crystals.

The indissoluble matter separated from the Saline,
was

was of a pale brown colour, with some shining particles interspersed; some small parts of it without previous calcination yielded to the Magnet: it burnt white: it fermented strongly with Spirit of Vitriol, and sparkled on the red hot iron.

Corol. It is impregnated with a Salt resembling the *Egyptian Natron*, or a Salt compounded of the native Alkali and marine Salt, to which a little calcarious Nitre seems to be joyned, with an absorbent Earth and Ochre; and the quantity of Salts it contains promise to give it not only a diuretic, but cathartic operation, provided it were drank in large quantities: and as an alterative, it seems to be not only a diluter, but from its calcarious earth, and the nature of the Salt above described, a sweetner of Acids, an attenuating medicine from the Salt, and a corroborating and deobstruent one from the Iron, it being not the weakest of the Chalybeates, so that it is akin to the *Scarborough* water, tho' weaker in operation, and its Salt of a different nature.

Dr. *Lynch*, to whom the public is indebted, as well for its recommendation in practice, as the following account of its effects, has hitherto used it only as an alterative, having given of it from one to three pints, and finds its operation to be chiefly by urine.

I am since informed that taken in larger quantities, as to six pints, it purges.

Several of the poor people had made use of it for some years past with great success, and several of the Doctor's patients drank it with great benefit, particularly in all nervous disorders of both sexes, Scurvies, Vertigo's, and the *Cblorosis*

S E C T. VII.

ENGINE-ALLEY Water in Dublin.

ALTHO' wholly unknown in medicinal use, yet as it belongs to this Class, and is of equal strength, as

to the saline impregnation, with the water of *Cawthorp* mentioned by Dr. *Short*, tho' a weaker Chalybeate, I shall here annex my examination of it, recommending a further search for such waters to others.

It has a strong, ferruginous disagreeable taste and flavour, and is somewhat fetid, much like smiths-forge-water, but it does not discolour Silver immersed as the Sulphureous waters.

It curdles with Soap, yields a white Sediment, and bubbles on the sides of the glass with solution of Potashes.

It fermented notably with Spirit of Vitriol. The solution of Silver exhibits a whiteness and sediment, with which is a blackness intermixt, as in the *Bristol* water: the Solution of Sugar of Lead whitens and exhibits an ochre-coloured Sediment.

Milk suffers no evident coagulation by being boiled with it:

But in another trial made next year, an obscure crack or curd was produced by boiling it with Milk:

It reddened Beef infused and boiled with it:

It soon turned green with Syrup of Violets, and this on standing all night, was of a bright green.

Galls gave it instantly a purple tincture, not only when taken fresh from the fountain, but when kept all night, when also it retained the ferruginous taste: But another year it gave only a pale pink-colour with Galls, and being further pump'd off did not continue so to do, so that it has not the ferruginous principle constantly.

It is observable of the tincture with Galls, as in several of the ferruginous waters, that as it is quickly struck, so it quickly vanishes, (and *vice versa*, when the tincture is more slowly struck, it lasts longer) and soon precipitates the purple-coloured grumes, and leaves a green circle at the surface, which green circle is also observable, even in that water which did not strike any purple with Galls, an appearance owing

ing to the Salt in this water, of which in the sequel :
So Logwood struck a pale blue with this water, which
also soon vanished.

The Analysis.

It throws up a reddish Scum, and tinges the channel red, and being set by, precipitates a brown yellowish ochre-coloured matter, which sparkled and smell'd strong on the red hot iron, and was scarcely attracted by the Loadstone.

That here is something Sulphureous appears further from the nails in the sucker of the Pump, which grow rusty and friable, so that it is necessary to renew them several times in a year. (a)

A gallon yielded on exhalation 160 grains of Sediment of a brown yellowish colour, and of a brackish taste; it moistens in the air, ferments with Spirit and Oil of Vitriol, and with the last emits a fume as Sea-salt, soon turns of a deep green with Syrup of Violets, and emits a pungent urinous smell when rubbed with *Sal Ammoniac*, and is a little pungent and ferid when rubbed with Salt of Tartar.

A. D. 1751. (another year) when it had very little of the Chalybeate principle, it however had the Saline nearly equal. For a gallon gave 132 grains of a light pale brownish Sediment, which in taste, in moistening in the air, in its effects on Syrup of Violets, and on *Sal Ammoniac* exhibited the same appearances here mentioned. It also sparkled and melted in blisters on the red hot iron.

The Salt separated from the indissoluble parts, is of the same colour and taste as the Sediment in gross, and moreover, being dissolved in distilled water, besides the brackishness manifests also a nauseous-bitter.

It moistens in the air, and emits the same pungent urinous smell when rubbed with *Sal Ammoniac*, as also with Salt of Tartar, and withal a peculiar Fetor
with

(a) Compare *Read* water in *Wiltshire* in my general History of mineral waters.

with the last. It turned slowly green with Syrup of Violets, which however on standing became a bright green. On the red hot iron it melted and crackled and hopp'd, especially when freed from its Ochre: it made no ebullition with Spirit of Vitriol, tho' it did with the Oil, and emitted an acid fume from it.

The Solution of the Salt in distilled water instantly precipitated a white grume with the solution of Pot-ashes.

Half a dram of the Salt boiled with half a pint of Milk curdled it moderately;

The Solution reddened Beef steeped and boiled in it.

Of indissoluble matter, I got about a fourth part to the Salt, which was of the colour of brown Ochre, sparkled on the red hot iron, was a little attracted by the Loadstone without calcination, fermented with Spirit of Vitriol, and turned slowly green with Syrup of Violets.

Corol. The impregnating Salt appears to be a composition of marine Salt, calcarious Nitre and *Natron*.

The first appears by the brackish taste, and the Salts crackling and flying on the red hot iron: The second from the bitterness of the Solution, and its precipitating with the solution of Pot-ashes: The third from the urinous smell excited by rubbing it with *Sal Ammoniac*, and Salt of Tartar, together with the deep green it exhibits with Syrup of Violets.

The indissoluble matter contains some Iron, a little Sulphur and calcarious Earth.

Scholium. *Hill* in his History of *Fossils* observes, that a Salt he calls *Halcryptium*, nearly akin to the *Natron*, is found in the *Pyrmont*, and other Chalybeate waters, which I have also confirmed in my examination of divers of them: nevertheless, I have designedly retained the less complex appellation of *Salino-Chalybeate*, in this water, (as well as in others, choosing to fix the denomination from the principles most predominating) rather than offend my reader with that of

Salino-

Salino-Nitroso-calcario Natro-Cbalybeate, the marine Salt being here the predominating one, as appears from
 1. its crackling and hopping on the red hot iron.
 2. its taste, 3. its emitting a fume like Spirit of Sea-salt on its mixture with Oil of Vitriol.

As to its *Operation*, five pints of this water gave me four stools in three hours, and so it's a laxative water.

S E C T. VIII.

COOMBE Water.

TO this Class belongs also a well situate in the upper end of the *Coombe* in *Dublin*, on the N. side of the street, and W. S. W. from the purging springs of *Francis-street*.

It is of a somewhat brackish taste, and sensibly ferruginous, and sometimes strongly so.

Galls at the fountain struck it of a dilute purple, Logwood of a blue when strongest, otherwise of a purple.

After it had been taken up four hours, Galls gave it but a very slight purple, and on carrying it half a mile from the fountain, the Galls ceased any longer to exhibit any purple colour.

Besides the purple-colour, both the Galls and Sumach exhibited a bright green circle near the surface, especially after standing a day or two, an effect common to this and most of the purgative waters.

It curdled with Soap: it exhibited a large white grumous sediment both with solution of Salt of Tartar, and with solution of Silver.

Oil of Vitriol and Spirit of Salt made a minute ebullition with it.

The Analysis.

It throws up to the surface a white, blue, and purplish Scum.

In exhaling, it leaves a white Scum on the sides of the vessel; and a gallon of it left 108 grains of Sediment being about $\frac{1}{4}$ part of the contents of *Francis-street* water, and is partly white and partly ochre-coloured

loured, of a brackish and bitterish taste; it turns of a bright green with Syrup of Violets, makes a small ebullition with Vinegar, and grows a little damp in the air, tho' far less than the Sediment of *Francis-street* water does.

The solution of the Salt in distilled water filtered was bitter, gave a white Sediment with the solution of Salt of Tartar, and a white grumous Sediment with the solution of Silver, and this last mixture on standing became blue.

The Salt in substance is of a yellowish colour, of a brackish and bitterish taste: it excited an ebullition and acid fume with Oil of Vitriol, but no ebullition with Spirit of Salt. It turns green on standing with Syrup of Violets. On the red hot iron it melts and rises in small blisters, like the Salt of *Francis-street* waters, which in this and other respects it resembles.

So, half a dram of it boiled with half a pint of Milk curdled it, tho' the water it self did not curdle Milk: it grew moist in the air, and rubbed on Beef laid by and boiled with it, reddened it here and there in bright spots.

The *indissoluble matter* which bore the proportion of about $\frac{1}{4}$ th to the saline, is partly ochreous, and being dried, sparkled and smell'd strong on the red hot iron, and calcined an hour acquired a strong taste of quick Lime.

Corol. Here is marine Salt, Nitre, some Iron, Limestone, and a little Sulphur.

It is a laxative water taken to five pints or more, and diuretic, much like the *Francis-street* water in its impregnating minerals, but weaker, however has this advantage, that it has a little Iron combined with the Saline parts, from whence it must undoubtedly derive something of a corroborating virtue, if taken on the spot: Such a combination enabling the waters thus impregnated, not only to carry off a present load of humours, but at the same time to strengthen the vessels to resist a fresh lodgement.

T A B L E VII.

Some of the principal Appearances afforded by the Purging Waters,

	Specific Gravity.	Sensible qualities.	Alcalies and Soap.	Solution of Silver.	Solution of Sugar of Lead	Solution of Alum.	Lime-water.	Acids.
<i>Epsom water.</i>		Bitter, nauseous and saltish: fetid on being kept covered.	A white grumous sediment with solution of salt of tart. and with spir. of <i>Sal Ammoniac</i> : curdles with soap.	A white bluish sediment.	A small white sediment.	A white grumous sediment.	Clear.	A small ebullition with oil of vitriol and spirit of salt.
<i>Carrickfergus purging water.</i>		Bluish: of a soft, sweetish, substringent taste, and bitter when further exhaled.	Curdles strongly with soap: a white sediment with solution of salt of tartar.	A white yellowish cloud, & turns bluish, with a small sediment.	A small whitish sediment.	Clear.		A minute ebullition with oil of vitriol and spirit of salt.
<i>Brine spring at Middlewick in Cheshire.</i>								
<i>Sea water</i>	1.030, when distilled water, 0.993.	Colour mixt of blue and green; somewhat unctuous, taste salt, bitter, nauseous: fetid on keeping.	A white grumous sediment with alcalies.	A stiff white curd.	A brown grumous precipitation.	Almost clear	A small flying grume.	Clear.
<i>Stretbam water.</i>	Hydr. at 4.0, when in distilled water at 5.6.	Of a a mawkish and saline taste.	Curdles with soap: a white grumous sediment with solution of salt of tartar.	A white sediment.	A pearl-colour, and small white sediment.	Some white grumes.		A small ebullition.
<i>Saline spring, near Carrickfergus.</i>	Hydr. at 0.6, when in distilled water at 5.0.	Taste like brine.	A white sediment with solution of salt of tartar.	A stiff curd and white sediment.	White.			A little ebullition with oil of vitriol.
<i>Kilroot wat. co. Antrim.</i>		Of a very brackish taste.	Curdled with soap: grumous with solution of salt of tartar.	A gross white cloud and bluishness.	A fine white cloud.			A minute ebullition with oil of vitriol.
<i>Francis-str. waters, Dub.</i>	Hydr. at 2.4, when in distilled water at 5.8.	Taste brackish and bitterish.	Curdles with soap: a white grumous sediment with oil of tartar.	A white grumous sediment.	White.	A white grumous sediment.	Whitish.	An ebullition with all Acids.
<i>Aqua d'Availles in Poitou in France.</i>		Limpid, and of a brackish taste.						
<i>Galway salino Chalyb.</i>		Taste and smell ferruginous.	Curdled greatly with soap					A violent ebullition with spirit of vitriol.
<i>Engine-alley water, Dub.</i>		Taste strongly ferruginous at some times.	Curdles with soap.	Whitens, with an intermixture of blackishness.	Whitens, with an ochre-coloured sediment.			A notable fermentation with spirit of vitriol.

Exhibiting

with their Comparison to some of the foreign ones.

Milk.	Flesh.	Syrup of Violets.	Galls.	Sumach.	Logwood.	Rhubarb.	Ash-bark.	Quant. of Contents in a gallon	Quality of Contents.	Operation.
A curd and clear whey.	Reddened beef a little.	Light green at the surface.	Wheyish and green.	Wheyish and green.	Crimson.	An orange-colour.	A pale blue circle at the surface.	Gr. 480.	Calcarious nitre and earth, and a little marine salt.	
A curd and clear whey.	Boiled beef white.	Pale green.	A bluish circle near the surface.	Wheyish, and a deep green circle on standing.	A pale purple soon fading.	A deep yellow.	A bright blue.	Gr. 132.	Calcarious nitre, a little marine salt and lime-stone.	Six pints purge
			Inky.					Two pounds.	Muriatic salt, a little bittern, ochre, and calcarious earth.	
A strong curd.	No redness to beef or mutton.	A light green	No tincture for the most part: a greenness in one trial.		A deep purple, or else crimson.	A brown amber.	A green bluish circle.	Nearly from two ounces & half to four ounces and a quarter.	Muriatic salt, bittern, sulphur and calcarious earth, besides accidental mixtures.	A pint purges: a greater quantity purges and vomits.
A curd.	A pale red to beef.	Light green.	Wheyish, and on standing green.	Green on standing.	Deep red.	Orange-colour.	Blue at the surface.	Gr. 100. and more.	Muriatic salt, nitre and absorbent earth.	Three or four pints purge.
			Wheyish.	Wheyish.	Deep red.	Brown amber.	Blue at the surface.	Gr. 996.	Muriatic salt.	
Was curdled, but not with a clear whey.	Beef was not reddened.	A light green.	Little tincture.	Greenish.	Red.	Brown amber.	Light blue.	Gr. 400.	Marine salt, and a little calcarious nitre.	Purgative and diuretic.
A curd.	Reddened beef as salt-petre.	Green.	Green.	Green.	Deep red or crimson.	Deeper than pipe-water.	A blue green	From Gr. 408, to 437.	Muriatic salt, calcarious nitre and earth.	Purges in the dose of four pints
								Gr. 170.	Chiefly muriatic salt.	
No coagulation.			Purple: and on standing greenish.					Gr. 118.	Natron, calcarious nitre, absorbent earth and ochre.	
No coagulation.	Beef was reddened.	Green.	A purple tincture in some seasons.		A pale blue.			Gr. 160.	A little iron, sulphur, calcarious earth and nitre, marine salt, and native alkali.	Laxative.

* N. B. This Table to be placed between p. 348 and 349.

B O O K VII.
Of the Petrifying
S P R I N G S.

S E C T. I.

*Of the Petrifying Spring at HERMITAGE or
BALLYDOWD.*

IT will appear in the sequel, that the small compass of the county of *Dublin*, which I had the honour of searching by order of the *Physico-historical Society*, affords a considerable number of *Petrifying springs*; and it is highly probable, that if a like search were carried through the rest of the kingdom, great numbers of this sort of springs would be discovered, and probably some of them equally saturated with the celebrated *Knaresborough Dropping well* in *Yorkshire*, an enquiry of the more importance, because these waters are possessed of considerable medicinal virtues.

At *Hermitage*, or *Ballydowd*, situated about five miles from *Dublin*, and on the North side of the river *Liffey*, are several springs of Petrifying water, distilling from rocks of Limestone abounding in that neighbourhood, and upon their slow motion or trickling down, forming, like the *Knaresborough Dropping well*, a stoney Incrustation on all the parts of vegetables, which they meet with in their passage, as Moss, Sticks, Stalks, Trunks of Trees, &c. some of which at length appear to be entirely converted into solid stone.

The water is very limpid, and of a pleasant taste, yet on being agitated in the mouth, leaves a very sensible

fible roughness on the palate, as I have also observed in some other calcarious waters, and particularly that of *Bristol*.

It curdles with Soap, and requires long agitation before it forms a lather: Oil of Tartar precipitated a small white sediment from it, Spirit of *Sal Ammoniac* exhibited a subtile incrustation at the sides of the glass: Solution of Sugar of Lead whitened it, and gave a white sediment, but not very large: solution of Silver excited some small ebullition, and gave it a pearl-colour, but no sediment: Solution of Alum gave a large white grumous sediment: Lime-water a small white incrustation at the sides of the glass.

The Acids, Oil and Spirit of Vitriol, and Spirit of Salt, all three excited a small ebullition with it.

Beef kept immersed twenty-four hours in it, and then boiled, acquired a little redness within: in the sequel, we shall see that the solution of its Salt had a greater effect.

Syrup of Violets struck a pale green with it, Ash bark gave a bright green circle at the surface: Logwood a purple, Brazil a pale scarlet, Rhubarb a brown amber; Galls turned it wheyish, and withal gave a bluish circle near the surface; Sumach turned it of an olive-colour.

The Analysis.

1. *Natural.* The Petrifications of this water all ferment with, and sweeten Vinegar, turn green with Syrup of Violets, and by calcination turn white, and acquire the perfect taste of Lime, and turn orange-coloured with the solution of Mercury sublimate corrosive in water, shewing that they are a true Lime-stone or terrestrial Spar:

In a pond where some of this water is received, it throws up a Scum and whitens the stakes of wood fastened in it like Lime-water: moreover, two drams
of

of one of the Petrifications being calcined an hour lost fourteen grains. (a).

2. *Artificial*. A gallon exhaled by a mild heat gave of a grey powder seventeen grains, which was of a brackish taste, and being boiled in two ounces of distilled water to an ounce, and filtered, nauseously bitter. This solution curdled with Soap, and precipitated a gross white grume both with Oil of Tartar *per deliquium* and solution of Sugar of Lead: it gave an evident redness to Beef steeped and boiled in it.

Scholia. 1. *Hermitage* water, and the solution of its Salt give the same evidences of an impregnating calcarious Earth, calcarious Nitre and a little Sulphur, that the *Knaresborough Dropping well* does, tho' in far less quantity. However, the absolute quantity of solid contents seems not to be precisely determinable by the weight of what is left upon evaporation; since it is probable that a considerable quantity is lost in vapor.

2. The Petrifications formed by this water are perfectly like those of the *Knaresborough Dropping well*, and the other *English* Petrifying waters, consisting chiefly of calcarious Earth, and a little Sulphur; but they are very different from the Petrifications of our *Lough Neagh* water, which are of a much more hard and solid contexture, and impenetrable both by Acids and by the Fire, as I have shewn elsewhere, and so are of an entirely different nature from these, for which reason I have not placed the *Lough Neagh* water here, but referred it to the accounts of the waters of Loughs and Bogs in general.

S E C T. II.

Petrifying Springs at H O U T H.

MY Friend *James Simon*, F. R. S. observes a petrifying quality in the Soil in this neighbour-
hood.

(a) Another Petrification from the county of *Downe*, lost one scruple out of three by calcination.

hood, particularly on the North shore on the E. side of the town, where he got a Petrification of Clay, and divers Shells cemented together strongly, and formed in less than three years : And

Here are at least two springs of this sort : the first issues from under the battlements of the Church-yard at *Houth*, and slowly trickling down a large collection of Moss which it finds in its passage, invests it with a stony crust :

It forms a fine cloud with solution of Salt of Tartar.

The Analysis.

A GALLON of this water left seventeen grains of Sediment, which was of a pungent saline taste, moistened in the air, and emitted an acid vapor, with Oil of Vitriol.

Corol. The Sparry or Calcarious matter in this water is combined with marine Salt.

A second Petrifying spring situated in a bay on the East side of the hill of *Houth* (where is the most commodious Bathing-place in the county of *Dublin*, with a house built for the reception of the bathers, by the Munificence of Lady *Houth*) may well be called the *Houth Dropping Spring*, the water dropping down the banks from a vast height on the sides of the rocks incrusts, and at length petrifies both the Moss and Stones in its passage.

That nothing is effected here, but a deposition of the calcarious particles of the water favoured by its slow dribbling motion, I was convinced by observing *June 12. 1751.* some of the Moss, whilst yet in a soft state, and like a gelly, being not yet perfectly petrified, which fermented very considerably with Spirit of Vitriol.

Scholium. The slow process of Nature alone is sufficient for the formation of these Petrifications ; for our artificial heat used in exhaling the waters, hurries off some

SECT. III. *Of the Petrifying Waters.*

some of the terrestrial parts in vapor, and blends the rest with the Salt accompanying them, whether calcarious Nitre, or marine Salt, or both.

S E C T. III.

Petrifying Waters on the Banks of the D O D E R.

AKIN to the former is the water which dribbles down the sides of the banks in some places on the west side of *Rathfarnam* bridge, where I found some curious Sparry bodies, and particularly the Petrifications called *Stalagmites Coralloides*: This water appears also to be replete with calcarious particles, which on occasion of its slow dribbling motion, it deposits, and forms Incrustations on the Moss and Grass.

It also cements the parts of the Clay and Gravel, and forms solid Rocks (*a*) some of them of a stupendous bigness in several places along the banks of this river between the west side of the bridge, and the rise of the river from the mountains at *Castlekelly*; and all these are manifestly meer Petrifications from the calcarious matter deposited by the water; for they all fermented strongly with Spirit of Vitriol.

This water curdled first, and then lathered slowly with Soap.

The Analysis.

A GALLON yielded from twelve to sixteen grains of a brown, raggy Sediment, of a brackish taste, and which fermented strongly with Spirit of Vitriol, and sparkled, flamed and stunk on the red hot iron: it emitted a vapor on mixing it with Oil of Vitriol.

Corol. This water is impregnated with calcarious Earth, Sulphur and marine Salt,

Z

S E C T.

(*a*) *Pliny* l. 31. c. 2. mentions waters both hot and cold, which turn earth into stone.

S E C T. IV.

CHINK Well.

ON the shore near *Portrane*, in a subterranean Cave, is a spring well known by the name of *Chink-well*, from the virtue tradition ascribes to it in the cure of Chincoughs; it's a pleasant water and used in making Punch. (a)

This water formed large curds with Soap and then lathered.

The Analysis.

IN dribbling down the sides of the arches of the Grotto, this water forms on the stones on which it falls, stony Incrustations of various figures, and vast extent, which fermented strongly with Spirit of Vitriol, burnt partly blue and partly purple, and in half an hour were reduced to a strong Lime.

A gallon of this water exhaled (which when evaporated low down whitened the sides of the pan) gave thirty-two grains of Sediment, which fermented with Vinegar, was of a brackish taste, moisten'd much in the air, and fermented and fumed with Oil of Vitriol.

Corol. This water is impregnated with calcarious Earth, a little Sulphur and marine Salt.

S E C T. V.

A Petrifying Spring near LOGGSHINNY.

IN the same county, and not far from the foregoing, and very near akin to it, viz. near *Loggshinny* on the

(a) Dr. *Behrens* in his natural History of *Hartsforest* in Germany, describes a Spring in *Beauman's Cave*, which perhaps may have a considerable affinity to this, viz. "It is of a most pleasant taste, excellent against the Stone, and a good pectoral, some who drank of it in the Cave in my presence coughed and expectorated such a quantity of tough phlegm, that they were eased by it to a surprize".

the Sea-coast between *Rush* and *Skerries*, is found another of these springs which forms large Incrustations of various figures on the rocks along which it dribbles, which Incrustations shew their calcarious nature common to all the preceding, by their fermenting strongly with Spirit of Vitriol, and in other appearances correspond exactly to Spar or Limestone.

S E C T. VI.

A Petrifying Water at SMITH'S QUARRY.

NEAR the City of *Dublin*, is found a water which, as it dribbles down the sides of the bank on the N. W. side of the quarry furnishing an excellent dark grey building stone, petrifies the Moss it meets in its passage.

The Analysis.

SOME of this water collected in a hollow near these Petrifications has a Scum on its surface like Lime-water: and a gallon of the water exhaled, left twenty grains of a light-brown Sediment, which was of a brackish taste, fermented greatly with Spirit of Vitriol, sparkled on the red hot iron, and emitted an acid fume with Oil of Vitriol.

Corol. Here is Limestone, marine Salt and a little Sulphur.

It is said to be binding in operation.

S E C T. VII.

AT *Diswellstown*, three miles and a half west from *Dublin*, and near the house of *Thomas Kennan*, is a spring, which also petrifies the Sticks and Moss it meets with in its slow current through a ditch, so that it is said, that a Stick of Thorn falling into it in *Autumn* will be petrified in about five months.

There is plenty of Lime-stone in the neighbourhood.

It lathers presently with Soap. It excites some little bubbles with Spirit of Vitriol.

Four pints exhaled to a dryness *November 17, 1755.* (a rainy season) gave twelve grains of a light-coloured Sediment of a brackish taste, which fermented and frothed greatly with Spirit of Vitriol. It sparkled but little on the red hot iron. It grew a little damp in the air.

The Salt separated from the terrestrial matter was partly yellow and partly white, and had the same brackish taste as the gross Sediment: It did not crackle on the red hot iron, but sparkled a little and stunk thereon, and it excited a great ebullition and acid fume with Oil of Vitriol.

Corol. This water is impregnated with calcarious Earth, a little marine Salt and Sulphur.

S E C T. VIII.

A Petrifying Water at TULLAGHAN in the County of Monaghan:

THIS water is quite insipid, and to the Eye as pure and pellucid as any water in the world, yet it leaves a Crust on every thing on which it runs; and its Petrifications examined correspond to those of the preceding waters.

These are all the Petrifying Springs in *Ireland* that have hitherto fallen under my notice: I doubt not but further observation will discover many more: in the mean time, it will be necessary to add some probable conjectures concerning their operations and virtues.

We have indeed but very few observations of these from positive experiments, and therefore must have recourse to Analogy.

It appears then from the above examination of these waters, that their predominant principle is a calcarious or sparry matter.

It is true they yield by the artificial *Analysis* but a very

very small proportion of this matter, from whence some may conclude that whatever virtues they may be possessed of, ought to be ascribed to the Element: But the quantity yielded by the artificial *Analysis* in all probability falls considerably short of the real quantity contained in the water, the terrestrial particles, being in so highly attenuated a state as to be partly carried off in vapor, which is also the case of the *Bristol* and *Mallow* waters, whose good effects as an absorbent, drying healing medicine we are assured of from experience, which yet by the artificial *Analysis* yield not a greater, and the *Mallow* water not so great a quantity of calcarious Earth as several of the above Petrifying Springs; so that, altho' these last mentioned contain a less quantity of this matter than the *Knaresborough Dropping well*, which hath been found effectual in the cure of inveterate Fluxes of the Belly, Dysenteries, the Diabetes and other excessive discharges; yet that the Sparry or Calcarious Earth which is the predominant principle, impregnating them in common with that and the other petrifying *English* springs, (whose virtues agreeable to their similar impregnating principles have also by experience been found to be similar,) should also entitle our waters to some share of efficacy, and probably equal to that of the *Bristol* waters, as an absorbent, drying and healing medicine, agreeable to the nature of their contained Earth, seems no rashness to affirm; and therefore their further use and application to these and other purposes is recommended to physicians.

T A B L E VIII.

In one View some of the principal Appearances

	Sensible qualities.	Specifick Gravity.	Soap and Alkalies.	Solution of Sugar of Lead.	Solution of Silver	Acids.
<i>Knareborough Dropping well.</i>	Very cold, extremely limpid and sweet.	24 grains in a pint heavier than common water.	Curdles with soap: a white sediment with oil of tartar.	A large white sediment.	No precipitation nor blackness.	Fermented with the earth.
<i>Ball or Band well.</i>	Of a very pleasant and sweet taste.		Curdles with soap: a large sediment with oil of tartar.			A great fermentation.
<i>Newton Dale wat.</i>	Cold, and very attringent.					
<i>Hermitage water.</i>	Very limpid, and of a pleasant taste.		Curdles with soap: a small white sediment with oil of tartar.	A white sediment.	Some small ebullition, & a pearl-colour.	A small ebullition.
<i>Houth spring.</i>			A fine cloud with solution of salt of tartar.			
<i>Spring on banks of Doder.</i>			Curdled first with soap, then lathered slowly.			
<i>Coink well</i>	Of a pleasant taste.		Large curds with soap, and then lathered			
<i>Smith's Quarry water.</i>						

Exhibiting

afforded by the Petrifying Waters.

Milk.	Flesh.	Syrup of Violets.	Galls or Sumach.	Quant. of Contents in a gallon	Quality of Contents.	Operation and Virtues.
Curdles.	The solution of the salt gave some redness to beef.		Muddy & green.	Gr. 185.	Calcareous earth, a little nitre and sulphur.	A powerful absorbent and astringent.
Curdles.		Green.	White, then green.	Gr. 80.	Calcareous earth and nitre, a little marine salt and sulphur.	Aborbent and astringent.
					A coarse Of-teocolla.	Cures loosenesses and hemorrhages.
	Beef acquired a little redness.	Pale green.	An olive-colour with sumach.	Gr. 17.	Calcareous earth and nitre.	
				Gr. 17.	Calcareous earth and marine salt.	
				From Gr. 12 to 16.	Calcareous earth, marine salt and sulphur.	
				Gr. 32.	Calcareous earth, marine salt and sulphur.	Said to be good in chin-coughs.
				Gr. 10.	Lime-stone or calcareous earth, marine salt and sulphur.	Said to be binding.

A P P E N D I X

Of Milky WATERS. (a)

IN the foregoing Sections I have described those waters which contain a terrestrial matter, or absorbent Earth, so minutely attenuated and dissolved as to be suspended invisibly in the (pellucid) element; but I shall now give a short sketch of other waters, whose terrestrial matter appears not to have undergone an equal degree of attenuation or solution, but is suspended in grosser *molecule* in the element, which are therefore opaque, milky or wheyish.

Such springs, tho' rare, are mentioned by Authors as found in different parts of the world, *v. g.* *Colonne* in his *Histoire de l'Univers* mentions two such springs in *Italy* or near it, which are of the colour of Milk, which he ascribes to Chalk or the like matter.

Natural
Hist. of
Oxford-
shire.

Plot mentions two springs in the way from *South-stoke* leading to *Goreing* of a milky colour, but not such a taste, issuing from a fat whitish Earth, and the water has always a kind of unctuous skin upon it, and yet to the taste is dry and styptical.

Natural
Hist. of
Lancashire

Leigh mentions a spring of this sort, from a white Marl, of an oily, pleasant and smooth taste, and lighter by an ounce in a pint than any water he had seen in those parts; Marl being a light body:

And a certain water, always of a wheyish colour, and no unpleasant taste, was brought me from a well on the lands of *Glass-carrick*, a mile S. W. from the *Abbey* of *Glass-carrick*, and twelve miles N. from *Wexford*, probably akin to the former, the neighbouring soil being marley, and which was also remarkably light; for the Hydrometre stood in it at 7. 0. when

(a) Some of the Sulphureous waters are also white, but the whiteness of these waters is chiefly owing to a different matter.

in the Nitro-Sulphureous water of *Upminster*, it stood at 6. o.

It lathered instantly with Soap, without any previous curds; nor did it exhibit any cloud or precipitation with the fixed or volatile Alcalies, tho' it gave a black cloud on being set by with the solution of Silver.

It caused no fermentation with Spirit of Vitriol.

The Analysis.

ON standing it throws to the sides large white grumes, which by and by precipitate in a sediment like wool.

A gallon exhaled left ten grains of Sediment, which was of a saline taste, fermented a little with Spirit of Vitriol, sparkled a little, smoaked and emitted a strong and somewhat suffocating smell on the red hot iron.

Corol. Since the water it self causes no fermentation with Acids, and the Sediment but little, and since the water exhibits no white precipitation with Alcalies, but a black cloud with solution of Silver, therefore the terrestrial matter contained is not pure Spar, nor a pure calcarious Earth or Chalk, but rather a mixture probably of some white Bole or Clay, which, as not capable of a complete dissolution by the Acid in the Earth, as Spar or pure *Calx* is, give the milky or wheyish opacity to the water: and moreover, the appearances of the sediment on the red hot iron betray something sulphureous, and its taste something saline.

B O O K VIII.

Of the Sulphureous

W A T E R S

C L A S S I. S E C T. I.

Of the Sulphureo-Nitrous Waters.

IT appears by the foregoing Histories of the Chalybeate and of the petrifying waters, that they generally contain some portion of an inflammable mineral matter, and indeed scarce any waters are wholly destitute of it, as appears from the histories of Rain-water, and of the hard and soft spring waters in my larger Work. These however are not to be called sulphureous waters, but such only in which the Sulphur is the predominant principle, or which exhibit most or all the Characters of an artificial solution of Sulphur, as in the above mentioned place I have shewn the waters, which are the subjects of this Book, to do.

Of these we have many, especially in the Northern parts of the kingdom, some of which contain a greater, some a less proportion of Sulphur, in some the Sulphur is more volatile, in others more fixed, in the greater part it is combined with the native Alkali or *Natron*, in others with the calcarious Nitre, and in others with Iron: and altho' the practical Observations I have given are by much the most copious on one of these springs, yet the divers casual Observations, which I have also here and there interspersed relating

to

to others of these springs, together with their chymical history, shewing a similarity in principles as well as virtues, are an argument that these waters may either be used promiscuously, or any one of them be prescribed instead of the other at the discretion of the physician when it happens to be more commodiously situated with regard to his patient, and agrees in strength and other congruous appearances; and where there is a difference in the strength of the sulphureous impregnation or in the quantity or quality of the Minerals combined with the Sulphur, the preference may be given to any one or the other accordingly, which to do judiciously is a mystery known only to the sagacious physician: for these reasons, I have thought it worth my while to descend to a minute examination of a considerable number and variety of the waters of this Class.

SWADLINGBAR Water

JUSTLY challenges the first place among the sulphureous waters of *Ireland*, for, tho' there are several waters in the neighbouring country more strongly saturated with Sulphur, yet as this is of the greatest antiquity, and we are best acquainted with its Virtues from experience and observation, it having been known near fifty years, and especially, since these last ten years, deservedly recommended itself to the notice of the learned by its good effects, in divers deplorable cases, I have placed it in the front of the many waters of this Class, with which the northern parts of this kingdom abound, and shall be more minute in my inquiry into the nature of its mineral Contents, as well as in the Histories of many memorable cases wherein its good success has been very remarkable.

This spring is situated in the county of *Cavan*, and on the borders of the county of *Fermanagh*, half a mile

a mile from the town of *Swadlingbar*, and about twelve miles from *Belturbet*; and when I visited it on the spot in the year 1739. it was covered with an Arch, and the Cistern was supposed to contain sixteen gallons: but since that time, on occasion of digging to make a gravel walk near it, there was some apprehension of the spring being lost, but very fortunately it broke out in another place near the former, and is now as strong, or stronger than before, as I conclude from my examination of specimens transmitted to *Dublin* in the year 1749 and 1750. and its smell and appearances with metals and their solutions, as well as its salutiferous effects.

In the neighbourhood of the spring is found Limestone, and plenty of Iron-mine in the neighbouring mountains, which formerly supplied an Iron work here (a).

This water at the fountain is sometimes limpid and transparent, and withal, like several others of this Class, has a bluishness when one views it from above, but it is very often white or wheyish. It presently betrays it self by the smell, which is like that of a
foul

(a) In the town of *Swadlingbar* near the bridge, is a Chalybeate water of considerable strength, which is also drank medicinally, and my ingenious Correspondent *John Odbert* assures me, that it has done great service in cases that require Chalybeates, and particularly, that a young Lady was surprizingly recovered by it from a *Chloresis* with a *Marasmus*.

It appears by a specimen of it transmitted to *Dublin*, A. D. 1749. to be one of our ordinary light Chalybeates, which however, after having been bottled three weeks, had the ferruginous taste strongly, tho' somewhat putrid, and struck a deep purple colour, with Galls, but did not tinge Silver at all.

N. B. This water may be either mixed with the neighbouring sulphureous water, and so make an extemporaneous Sulphureo-Chalybeate water, like that of *Ballynabinch*, or the use of it may be interposed, or ordered subsequently to the other, at the discretion of the physician.

foul Gun (a). It is soft to the taste, and has the flavour of an hard-boiled egg, even as some artificial preparations of Sulphur also have. Its smell at the fountain is very strong in frosty weather.

In clean bottles well corked and sealed, it retained the smell very little weakened kept by me above two years, and in another specimen four years, tho' in some bottles less carefully corked, it had quite lost the *Fetor*, and deposited some flakey Sediment; but if it either stand in a vessel exposed to the air for seven or three hours, and sometimes in a much less time, or if it be heated to a much less degree than that of boiling, it loses its smell and transparency; but if it be taken immediately from the fountain in a dry season, and put into clean bottles well corked, it very well bears transportation to *Dublin* and other remote places, with its sensible qualities entire as at the fountain-head, a circumstance giving it greatly the preference to most of our Chalybeate waters which soon grow effete upon carriage to any distance: and accordingly I have ordered it to be drank in winter by some patients in *Dublin* with advantage, having been taken up in a dry *September*.

The specific Gravity of this water was nearly the same as that of the neighbouring brook, as was also its heat, allowance being made for the action of the sun upon the water of the brook:

It curdled but a little, and soon after, lathered smooth, with Soap, and exhibited but a very minute cloud and precipitation with the fixed and volatile Alkalies, nor did Lime-water produce any change in it.

The experiments with the Metals and their Solutions furnish a probable estimate of the degree of the strength of the sulphureous impregnation, according to

(a) The hot sulphureous waters of *Aix la Chapelle* have the same smell.

which this water seems to obtain a middle place between the strongest and weakest of the sulphureous waters. Thus, either at the fountain-head, or taken from corked bottles in *Dublin*, it tinges Silver immersed a few minutes in it of a leaden or blackish colour with a copper-like hue; and sometimes black, even in a specimen of it transmitted to *Dublin*.

So solution of Silver, both at the fountain and here, exhibited an amber-coloured and whitish cloud, which when shook up became livid, and at length precipitated a dark-brown sediment.

Solution of Sugar of Lead exhibited nearly the same appearances as solution of Silver.

Iron infused in it was blackened; and the Solution of *English* Vitriol, in the wet summer 1739. at the fountain, turned the water of a dark olive-colour, and blackish at the surface of the mixture only, whereas the same Solution turned some of the same water brought to *Dublin* in another season black all over, and withal exhibited a copper-coloured and variegated Scum: the blackness was more or less intense according as the bottles, being better or worse corked, retained the sulphureous smell more or less.

Scholium. Hence we may form a probable conjecture of the nature of the variegated Scum found on the surface of Chalybeate waters, viz. that it is in a great measure Sulphureous: Here indeed, it is the result of a mixture of Vitriol and Sulphur; but a Scum of various colours, as blue, red and white is also observable on the meerly sulphureous waters, particularly our present water as well as several of the *English* sulphureous waters.

Bell-metal acquired a bluish colour from this water. The Solution of Mercury in *Aqua fortis* exhibited a light brown Sediment with it, and the Solution of Mercury sublimate in water a large brown reddish one. Gold immersed grew of a deeper yellow, and
Copper

Copper of a deeper red : so that most Metals and their solutions, except the two last, acquire a dark colour inclining to black, by their mixture with or infusion in this water.

Next, the appearances with the Acids mixed with this water were remarkable, viz. Vinegar and juice of Lemons caused a minute ebullition with it, Oil of Vitriol and Spirit of Vitriol caused a minute ebullition, not only with the fresh water, but also with the same water evaporated to the consumption of half; and in the mixture of Oil of Vitriol and this water, there was observable on standing a small yellowish and somewhat grumous sediment: and in a mixture of this water two years old with Oil of Vitriol there was observable a white cloud floating in the middle, as also in the middle of a mixture of the same water, and Spirit of Salt: So *Aqua fortis* exhibited a minute ebullition, and then a small sediment. These appearances seem plainly to be owing to these Acids attracting the Alcaline salt in the water, whence this last lets drop the sulphureous matter, as in making *Lac Sulphuris*; for were the precipitated matter a meer Earth, it would be dissolved by the mixture of Acids, and the mixture be rendred more transparent, as in the calcarious waters, but Sulphur remains untouch'd by Acids; and hence we may also account for the colour of the sediment which was precipitated by solution of Alum from this water at the fountain, viz. which was white brownish.

The appearances with the tincturing articles quadrate also well to an impregnation with an Alcaline salt; for Syrup of Violets struck the water of a deep green colour, Ash bark yielded a bluish green circle near the surface, Rhubarb gave a deep red tincture, Brazil a dilute crimson; and all these tinctures were much deeper with this water than with that of the neighbouring brook, and with pipe water and distilled

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led water in which the like proportions of the same articles were infused.

So Logwood struck it of a deep purplish colour, and it was observable, that most of these tinctures were equally deep in the water, which had lost the sulphureous smell, as in that fresh taken up from the fountain.

Galls and Balaustine flowers yielded no considerable change of colour, at least no tendency to purple, so that here is no ferruginous admixture.

The Analysis.

I. *Natural*, or that which is effected by a spontaneous separation of its parts.

This water soon loses its smell and turns wheyish, on being a little while exposed to the air. The surface of the water in the well is ordinarily covered with a whitish or bluish Scum. The Mud is covered with spots of a yellow-green (*a*) colour, like common Sulphur; and in dry weather it is said, that there is ordinarily observable (*a*) a redness at the bottom of the well.

The Mud being dried and thrown on a red hot iron, sparkled, and in some spots flamed with a blue flame, and a sulphureous smell, such as also infected my hands on handling it.

In repeated examinations of the water made in different years which had lost its *Fetor*, there were observable partly floating, and partly precipitated to the bottom, certain fusc or purplish-coloured Flakes, like thin leaves: these, being collected and dried, sparkled greatly on the red hot iron and stunk, being an assemblage of the sulphureous particles attracting each other.

A dark-

(*a*) (*a*) So in the natural hot Baths at *Glasbitten* seven miles from *Schemnitz*, which gild Silver left in them, the Sediment is red and green, and the sides of the Bath covered with a white, red and green substance: and the Sediment of the hot Baths of *Eisenbach* in *Hungary* is red.

Brown's Travels.

A dark grey sediment spontaneously deposited in some bottles, being dried and thrown on the red hot iron, emitted a white flame and stunk.

It is common to this, and other sulphureous waters, to turn the Earth and Sludge in their course black, and other extraneous bodies, as Sticks, Leaves and Grass white, precipitating a white matter like magistry of Sulphur.

It is also common to this and many other springs to be affected by changes of weather. Thus this water, which is otherwise transparent, has been observed to become white as milk before great Rains, and withal to be then more than ordinarily fetid.

The artificial Analysis.

I distilled twenty-seven ounces of this water in a retort and receiver well luted, drawing off to eight ounces. The distilled water had no sulphureous smell, (a) as neither indeed had the remainder in the retort, (b) from whence I wou'd rather infer a new coalition of parts, than an avolation of the sulphureous ones, which it is hardly credible should pass thro' either the glass or juncture.

In reiterated trials which I made on eight several specimens of this water transmitted to *Dublin*, in different years, I found that a gallon of it exhaled to a dryness by a mild heat in a glazed pan, yielded from twenty-four to sixty-four grains of *residuum*, or at a *medium*, forty-three grains, which was of a whitish or grey, and brownish colour, had but little smell, but

A a was

(a) *Pot* observes the same thing of the sulphureous water of *Deddington*, and *Marsili* of two sulphureous waters by him examined in his natural History of the *Danube*.

(b) Something like this occurs also in the distillation of some waters, particularly those of *Leeks*, *Erisimum*, *Perficaria acris*, *Cardamine*, &c. whose acrimony is so delicate as to be destroyed, even by the heat of the cold still, neither rising in the water, nor perceptible in the *residuum* left in the still.

was of a strongly urinous taste, and a little brackish and bitterish :

It fermented with all Acids, turned presently of a grafs-green with Syrup of Violets :

It emitted a strongly pungent and urinous smell when rubbed with *Sal Ammoniac*.

It also excited a sensibly pungent smell, tho' weaker, when rubbed with Salt of Tartar, it likewise emitted a pungent smell when rubbed with Quick-lime, (these two last are Characteristicks of the *Natron* or *Nitre* of the Ancients) and with Salt of Tartar, there was besides the pungency, somewhat of a greasy or fetid smell, an argument of some adhering Sulphur.

Being rubbed on Beef and Mutton laid by two days, and then boiled in water, a redness was imparted, as from Saltpetre.

Rubbed with the solution of Mercury sublimate corrosive in water, it exhibited a slight yellow cast :

On the red hot iron it sparkled and stunk, and burnt black.

The Salt separated from the indissoluble parts was of a brown or yellowish colour, of an urinous taste, fermented with Acids, and the solution of it in distilled water, felt soapy between the fingers, mixed smooth with Soap, and continued clear with Spirit of *Sal Ammoniac*, and with Solution of Salt of Tartar, agreeable to its homogeneous alkaline quality ; also it turned of a deep green with Syrup of Violets, reddened the tinctures of Rhubarb and Sena, and advanced the redness of the tincture of Brazil, and the blueness of Ash-bark ; and all these tinctures it deepened much more strongly than did a Solution of equal strength of the Salt of *Pyrmont* water, or of the natural bitter purging Salt : nor did half a dram of this Salt boiled with half a pint of Milk curdle it, as the last mentioned Salt does.

Mixed with human blood flowing from the veins, it rendered the blood remarkably more florid and less tenacious

tenacious than another portion of the same blood flowing from the same veins.

It moistened a little in the air: On the red hot iron it sparkled a little, and rose in small blisters, and burnt black.

It required above twenty times its own weight of distilled water to dissolve it.

The Earth, or indissoluble matter separated from the Salt and dried, sparkled on the red hot iron: It fermented with Acids; it turned green with Syrup of Violets, but much more slowly than the Salt did: upon calcination it grew more white, and gave to water a sweet taste like Lime.

Corol. *Swadlingbar* water then betrays its Sulphur as the predominating ingredient by the smell and taste, by the colour it imparts to Metals and their Solutions, by the white cloud, and by the sediment precipitated from it by the mineral Acids analogous to the production of *Lac Sulphuris*, and by the white matter precipitated from it on Sticks, Leaves, and Grass.

This Sulphur is in a great measure volatile, as appears from its being soon lost on being a little while exposed to the air, and by a heat much less than that of boiling water. It is not however so far volatile, but that if the water be preserved in clean bottles carefully corked, it will retain its native qualities entire, as at the fountain for many months: nor is its Sulphur entirely dissipated by flying off in the air; but partly precipitated, as appears by the foliaceous purple-coloured bodies observeable in the water long kept, as also by several of the above experiments and observations on the Mud and Sediment precipitated from it.

It is also impregnated with a native Alcaline salt, of which the following appearances summed up in one view may amount to a demonstrative proof, *viz.* its urinous taste, its fermenting with Acids, its solution

continuing clear with Alcalies, its turning of a deep green with Syrup of Violets, and affecting the other tincturing articles in the same manner as alkaline Salts do, by its increasing the florid colour and fluidity of the blood, and by the *residuum* imparting a redness to Beef or Mutton, on which it has been rubbed, (an effect common to Saltpetre or the Nitre of the moderns, and to the artificial Alkaline Salts) and as the Nitre of the Ancients had most or all of these properties, I have therefore affixed the name of Nitre to this and the rest of the Salts, in the sulphureous waters, which exhibit the same appearances:

Lastly, it contains an absorbent or calcarious Earth in small quantity, and tho' it is not without some mixture of calcarious Nitre, yet as the above are the predominating principles, it shall suffice to affirm that this water is impregnated with a moderate quantity of Sulphur partly volatile, and partly fixed, together with an alkaline Nitre or *Natron*, and a little absorbent Earth; and consequently that it is entituled to whatsoever Virtues can be the result of such a combination; particularly, that it is a sweetener of Acidity, not merely from the element, but from the alkaline Salt, that it is balsamic, healing, detergent, inciding, dissolving, &c. and that the combination of the Sulphur with an Alkaline Salt forming a kind of Soap, (a) may probably give these waters a powerful activity, as an aperitive medicine, in the cure of divers chronical diseases according to the hint elsewhere given; all which will be confirmed by the histories of its Operation and Effects in the cases to be annexed.

In the mean time, it may not be useless here to observe, that one obvious consequence of the above *Analysis* seems to be that the use of Acids in drink or food, is highly improper during a course of these waters, viz. as being destructive of the native Alkali, and

(a) Alkaline substances mixt with Sulphur give it a power of dissolving any Metal, (Gold itself not excepted) as is well known of the *Hepar Sulphuris*.

and tending to precipitate the Sulphur with which they are impregnated.

And next, from the foregoing *Analysis* we may now be enabled to make a comparison between the Contents of this our cold Sulphureous water, and the hot one of *Aix la Chapelle*, viz.

The Sulphur and native alkaline Salt are common to both, but the Salt is in a larger proportion in *Aix la Chapelle* water, than in this of *Swadlingbar*, and in the *Aix la Chapelle* water there is a mixture of marine Salt, of which our *Swadlingbar* water gives no tokens: the absorbent Earth is common to both.

Upon the whole, the *Aix la Chapelle* waters have a greater proportion of Salts, and are therefore somewhat purgative, which the *Swadlingbar* waters are not but accidentally. The first are also on the same account, as well as the actual Heat giving a greater activity to the impregnating mineral, more stimulating and more powerfully attenuating than the last, which however, altho' less loaded with Salts, and perhaps with less Sulphur, or at least a Sulphur not actuated by Heat may on these accounts even deserve the preference in some cases where a milder and less irritating medicine is required.

Having so far resolved the minerals impregnating this water, into their constituent parts, it may be worth our while to enquire how far these may be imitated by artificial compositions, both because this may serve as an illustration and confirmation of the justness of the above *Analysis*, and enable us perhaps in some measure to supply the place of the natural by artificial waters.

Some indeed have imagined, that this and other like waters do scarcely differ from common water grown fetid by stagnation; but upon making the comparison between this water and fetid Rain-water, and Dew, and divers Chalybeate waters grown fetid by Putrifaction, it appeared that these last had but very little effect in discolouring metals and their Solu-

tions like our Sulphureous waters, and indeed for the most part none at all: But

Russia Potash not depurated seems to make a nearer approach to the solid contents of our water; for altho' it be a production of the fire, and tho' the combined Sulphur be rather vegetable than mineral, yet it exhibits several appearances like those exhibited by our water, tho' the Salt impregnating our water be far milder in its degree of acrimony, not being the production of fire.

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"The *Russia Potash* then has a strong, fetid, sulphureous smell and taste, as well as a bitter and lixivial taste. As it has been dissolving in water, there have been scummed off from some lumps of it, a dark, purple, bituminous substance, like *Petroleum* or Tar, which readily dissolved in the *Lixivium*. The *Lixivium* will presently tinge Silver of a dark purple colour difficult to rub off; but a meer lixivial Salt has no such effect.

So that the *Russia Potash*, before depuration, appears to be a composition of Sulphur and an alkaline Salt, like the solid contents of our water. (a)

But the two following preparations or solutions of Sulphur seem to make a nearer approach to the natural composition of our water, viz.

I. I made three different Solutions of the *Sulphur solubile* prepared according to *Boerhaave's* process of nine parts of *Flores Sulphuris* to two parts of Salt of Tartar; the first was of three drams and one scruple to a pint of water, the second was of but half the strength of the first, the third of a dram to pint of water.

Now these artificial preparations of Sulphur produced, on the immersion of Metals, and on the mixture of the metallic Solutions, appearances perfectly analogous

(a) Dr. Lucas also remarks, in his account of the Baths of *Aix la Chapelle*, a considerable affinity between the saline parts of their *residuum*, and those of *Soda* or *Kelp*.

logous to those exhibited by our *Swadlingbar* water thus : Gold by an infusion of an hour and half in the strongest of these solutions became of a deeper yellow ; and Silver immersed in the same solution, became black all over ; but in the weakest of the solutions, it became of a copper and leaden hue, much as in the *Swadlingbar* water. Solution of Sugar of Lead exhibited with the weakest of the solutions a black sediment. The Solution of *Englisch* Vitriol with the same solution, exhibited a dark olive-coloured cloud, and a dark blue colour, but caused a black and green precipitation with the two stronger solutions : but when I immersed a piece of Silver in one of these solutions which I had purposely exposed in a wide-mouthed glass, it was but very weakly tinged of the same colours as above mentioned, even as happens to *Swadlingbar* water sent in bottles badly corked, or when the water has been exposed to the air, which causes a visible precipitation of the Sulphur in the artificial, as well as in the natural solution ; and moreover, even a stronger solution of Sulphur than either of the three above mentioned loses its *fetor* by long boiling.

2. The next preparation of Sulphur, imitating the natural composition in sulphureous waters, is with quick Lime, which has the same operation as fixed Salts in rendering Sulphur dissoluble in water : for if half a dram of *Flores Sulphuris*, and two drams of quick Lime be but just boiled in a quart of water, they exhibit an highly fetid water, much like the natural sulphureous waters : Also this solution of Sulphur being exposed to the air loses its *fetor*, and precipitates its Sulphur in form of a *Lac*, and is one good way of preparing *Lac Sulphuris*, as well as a beautiful illustration of the formation of that natural white Precipitation we ordinarily find on the leaves, grass, &c. washed by the sulphureous waters.

Another way of making an artificial sulphureous

water is by boyling (a) an ounce of the *Flores Sulphuris* in twelve pints of fresh made Lime-water, to eight pints, and for gratefulness four drams of the lesser Cardamom seeds may be added near the end of the decoction, which is to be kept in a vessel well stopt until it grows cold, and decanted and bottled up for use, and may be taken from half a pint to a pint twice a day, as well as used externally as a lotion, in the same disorders as the *Swadlingbar* water, particularly in rebellious diseases of the Skin with good success, as I experienced in several patients in *Steven's* hospital in *Dublin*.

These two last mentioned preparations of Sulphur with Lime, agreed very nearly to the natural sulphureous waters in most appearances; particularly

1. In the fetid smell, and in the flavour, resembling that of boiled eggs, and where the Sulphur was in larger proportion, the smell resembled that of rotten eggs.
2. In the similar appearances arising on immersing Gold and Silver in them, and by the admixture of the metallic Solutions, viz. Silver immersed in them half an hour, became of a copper-coloured and leaden hue, and after a whole night's immersion, quite black; Gold was brightened: solution of Silver caused a grumous and turbid appearance in the upper part of the mixture, and a dark brown yellowish sediment; Solution of Sugar of Lead gross yellow clouds, and a dusky coloured sediment, with a bluish circle at the surface of the mixture; solution of *English* Vitriol a dusky olive-colour, and then a lead-coloured sediment.
3. When these artificial sulphureous waters have been exposed to the air, they partly precipitate their Sulphur, and partly throw it up to the surface, (even as also happens in the natural waters) and then they lose both their

(a) In the same manner is the natural sulphureous water of *Fonsanche* in *Languedoc* (of which elsewhere) imitated, being much alike impregnated as our *Swadlingbar* water, and possessed of the like virtues.

their *fetor* and their property of discolouring Metals, and causing the dark-coloured precipitations with their solutions.

Upon the whole, these artificial sulphureous waters, whether prepared with quick Lime, or with Salt of Tartar, resemble the natural in most appearances: nevertheless, they differ from, and seem to yield to the natural in two respects, *viz.* 1. in transparency; for the artificial are of a yellow greenish colour, whereas several of the natural sulphureous waters are exquisitely transparent, an argument of a more intimate attenuation and solution of the Sulphur in the last. 2. The artificial are possessed of a greater degree of Acrimony from the fire; upon both which accounts the natural, or rather divine composition seems, in this as well as in many other instances, to be preferable to the artificial or human, tho' where the first cannot be had, the last may be admitted as a Substitute.

I proceed now to describe the Operation and Virtues of the *Swadlingbar* water, not from speculation, but observation and experience, the only sure tests of the effects of any medicine on the human body. The foregoing experiments indeed will, I trust, be of considerable use to the rational physician, in exhibiting a clear account of the distinguishing Minerals impregnating this water, and enable him by the discovery of the true qualities of his remedy, to apply it more properly, and to far greater advantage than a meer empiric can do, as well as by a just analogy to extend its use much farther to divers other cases besides those wherein it has succeeded by meer chance: and likewise, where it may be necessary, to substitute other waters similarly impregnated instead of this, with a reasonable prospect of equal success.

The use of this water has been chiefly internal, and its operation found to be for the most part by urine and perspiration: It is not ordinarily purgative. Seven persons in health for experiment's sake drank each
of

of them four pints of the water at the fountain, and were costive after it: Nevertheless some Patients are purged by it, but perhaps from an acid Acrimony in the *primæ viæ*. If a large draught be taken at once, it excites vomiting in some: (a) and if drank fast, has been observed to give the headach. It has proved emmenagogue in divers experiments. An ordinary effect of it is to throw out Pustules on the Skin, but this is also common to several other mineral waters, and even to common water, as are also its virtues in restoring lost Appetite, in the Gravel, and giving briskness to the Spirits; I shall therefore not expatiate upon these, but give an account of such diseases wherein it has been found more peculiarly efficacious, from well vouched facts.

I shall begin with its good effects in disorders of the *primæ viæ*, in which, not only it's diluent and balsamic quality, but its impregnation with a native Alkaline salt, as a corrector of Acidity also seems to have a share.

Of its agreeableness to the stomach the following history may serve as an instance: a Gentleman came to *Swadlingbar* with a set of company, with an intention to drink Claret more than Water, and accordingly spent whole nights there in this criminal indulgence, in which he was too readily encouraged by the effects of *Swadlingbar* water as an antidote; for he affirmed, that two or three quarts of it taken next morning quite sober'd him, and made him as fresh and active as if he had taken his natural rest: he also had a good appetite.

A young man had laboured under a severe Dysentery three months, from which he was perfectly recovered by

(a) It is a frequent effect of our cold sulphureous waters to excite vomiting at first taking, in delicate stomachs, and common to them and the hot waters of *Aix la Chapelle*, which indeed most of the sulphureous waters of this Class resemble in most of their qualities, except Heat.

by drinking five pints of this water every morning for ten days. (a)

The sulphureous waters of *Moffat*, and those of *Bourbon*, *Aix la Chapelle*, and *Bath*, have been long eminent in the cure of stubborn Colics; and that our water may lay claim to equal, if not superior efficacy in some of these cases, may appear from the following facts:

A middle aged woman was subject to Colic pains, which used to go off by a spontaneous looseness; and in consequence hereof, she had lost her complexion and strength: She drank these waters for five weeks, which purged her much and restored her perfectly: they threw out pustules on her Skin with itching on her first using them.

A Lady aged fifty, subject to flatulent Colics, was cured by a spontaneous eruption of Pustules on the Skin; but this method, which nature used for her cure, tho' effectual, was not agreeable to her: she therefore anointed with Brimstone: hereupon her Colic pains returned, attended with spasms, and withal she had an immoderate *Fluxus Uterinus albus & ruber*. A Kinsman of hers, from an idea he had formed of the operation of these waters, recommended them with a view to expel the morbid matter again to the surface of the body:

Accordingly she drank several dozen bottles of the water sent from the well to the county of *Carlow*, with the desired effect, viz. she was cured of her Colic, as also of the above mentioned discharges, and became much more healthy than before, but her skin was over-run with pimples attended with great itching.

I am informed of another stubborn Colic of the hysteric kind, cured by drinking these waters, and of a third

(a) See a like instance of the waters of *Pettigoe*, Class 2. Sect. 3.

a third also, even after those of the *Bath* in *Somersetshire* had proved ineffectual, the particulars of which I was not acquainted with ; but the following case fell under my own inspection.

November 1749. a woman aged about thirty-five, of a gouty extraction and weak constitution, had been troubled with a Sciatic pain, extended once or twice to the neighbouring knee and hand ; and this was usually succeeded by a bilious Colic ordinarily ending either by a vomiting, or by a discharge of green stools : these disorders had alternately succeeded each other by frequent intervals for the space of three years ; withal there was a fixed hardness and swelling at the region of the stomach.

Having taken divers medicines without the desired effect, she went to *Bath*, where she resided a year and half, drinking and bathing, and interposing the use of mild purges, and sometimes warm medicines, with a view to throw out the supposed latent gouty matter, which view was so far answered, that something which seemed to be of this kind appeared on the ball of the great toe, and on the knee, tho' this proved of no continuance, but was succeeded by a surprizing discharge of lymph thro' the pores of the Skin, and especially on the soles of the feet, in great quantity, which discharge, when liberal, always was attended with an abatement of the Colic pains, and *vice versa* :

Nevertheless, during the space of nine months after her return from *Bath*, the Colic pains frequently returned, tho' more rarely and with less severity upon her drinking largely of a Decoction of *Guaiacum*, sometimes interposing her usual Cathartic, an infusion of *Sena* with *Manna* and *Glauber's* Salt, and sometimes *Cheltenham* water, especially in the paroxysm ; but she was in a very languid state, low-spirited, and had lost her complexion.

Encouraged by the good effects of the *Cheltenham* water, I ordered her in *October* 1750. to take the
Swadlingbar

Swadlingbar water in *Dublin*. She began with a pint, and gradually increased to a quart and three pints in a day, and finding it to give her a sensible warmth and increase of appetite, she persisted in its use about four months in that winter-season : Hereupon the return of her Colic pains became much more rare, and her skin of a better colour, but still the discharge at the feet above mentioned continued.

May 1751. She went to the fountain, and having premised a dose of physic, took the water, gradually increasing the dose until she took six pints in a day, which she continued (notwithstanding the extremely unfavourable wet season) for the space of four months. It kept her belly soluble, perhaps from an Acid in the *primæ viæ* (of which the green stools attendant on the Colic pains seemed to be a probable indication) uniting with the native Alcaline salt in the water, and therewith forming a *Sal neutrum*: however, persevering in the use of this water as above, together with daily riding, she recovered strength of body, spirits and appetite, nor had any considerable return of her Colic pains all this while, tho' she did not interpose physic to the use of the water, because this alone had the effect above mentioned.

She continued to drink the water thro' the following autumn and winter, but took only from four to two pints every day, and was entirely free from the Colic pains, as also for the most part thro' the following summer and winter, in which last mentioned season, she still took a quart every day; and the hardness at the region of the stomach, almost, tho' not entirely vanished, and she enjoyed vigour of Spirits, tho' the above mentioned Discharge still continued.

There were several instances of this water's curing the Heartburn; but the following is a most memorable and signal instance to this purpose, even of its correcting the highest degree of acrimony in the *primæ viæ*; and as the case has been accurately described by
my

my ingenious correspondent, the patient himself in elegant and pathetic terms, I shall here subjoyn it in his own words,

S I R,

“ ABOUT four years ago, I was seized with a
 “ common *Cardialgia*, which gradually increased
 “ for some time, for which I did not take any me-
 “ dicines, but endeavoured by a suitable regimen,
 “ and abstaining from every thing that was offensive
 “ to my stomach, to restore it to its former tone,
 “ which indeed with its juices, might have been vi-
 “ tiated by a pretty free way of living, and drinking
 “ sometimes liberally, (tho’ not to excess) of the manu-
 “ factured Spirits of this country, commonly called
 “ *Whiskey*, which was the first thing, as well as foreign
 “ Spirits, that gave me any uneasy sensation in my
 “ stomach, all of which, I then abstained from; how-
 “ ever, the disorder still gain’d ground on me, so that
 “ wine and malt Liquors were laid aside, as the least
 “ taste of them gave me great disturbance. *Irish* Cyder
 “ was the last of any fermented liquor that agreed
 “ with me, and that but a short time; so that at last
 “ I drank nothing but Milk and Water, for Water
 “ alone now raised the pain, as much as the stronger
 “ liquors had done before. The distemper was now
 “ fix’d with great violence, and tho’ I had a great
 “ aversion, and was timorous to take emeticks, I at
 “ last resolved on a course of them, as the disorder
 “ manifestly indicated their use; this course I pursued
 “ with great resolution, for near two years; and from
 “ the best of my calculation, I took in a mean pro-
 “ portion of time, one every three days; I have some-
 “ times taken three in thirty hours: as they and o-
 “ piates were all my relief, which indeed was only
 “ transient; for upon every meal, the pain attack’d
 “ me with the utmost fury; seldom upon a full stomach,
 “ but

“ but generally about two hours after, when digestion
“ was performed, and the meat thrown out of the
“ stomach into the guts; this was evident, as I fre-
“ quently took vomits in that space of time after
“ eating, when no remains of the meal appeared in
“ the contents; so that the powers of the first con-
“ coction, seem’d to be no way in fault; what came
“ up was as sharp as Spirit of Vitriol, and there float-
“ ed on the surface, a tough viscous substance in ap-
“ pearance much resembling yeast; nor in all the
“ course of vomiting, was there the least tinge of
“ bile, or taste of it in my mouth; except two or
“ three times, in the latter part of it.

“ The Emetick I constantly made use of, was the
“ hypo Wine; only twice or thrice, (for experiment’s
“ sake) I made use of the Emetick Tartar, in order to
“ open me downwards; but it operated with such vio-
“ lence, tho’ I took at the most but three grains, that
“ I thought it would have destroy’d me.

“ I should have told you, that an obstinate Cos-
“ tiveness came on with the disorder, for which at
“ first I took suitable lenients and catharticks, but
“ as the distemper became worse, there was nothing
“ I could think of, tho’ ever so mild, but what gave
“ me intolerable pain, as the Lenitive Electuary and
“ Cream of Tartar-whey with Manna, has raised the
“ disorder to such a pitch, that it was near putting an
“ end to a miserable being, if I had not instantly
“ thrown in an Emetick.

“ A gentleman, a friend and worthy practitioner,
“ one day perswaded me (notwithstanding I told him
“ the consequence) to take a little *Elixir Salutis*, but I
“ paid dearly for my compliance; for had it not been
“ for my other friend, the hypo Wine, it would in
“ all probability have sent me out of the world.
“ Clysters indeed I did not make use of, having lit-
“ tle encouragement; for once in three, and some-
“ times four days, when I had a stool, which came
“ from

“ from me with the greatest pain and difficulty, the
 “ *Fæces* being hardened, I found no benefit, but have
 “ often had the pain in my stomach, come on with
 “ the greatest rack, upon the evacuation.

“ I was advised to try the Gums, but that advice
 “ I wou’d by no means comply with, as I knew the
 “ consequence; however, by a hint from the works
 “ of a late eminent physician, I took, by way of ex-
 “ periment, a Pill of *Assa fætida*, but for fear of the
 “ worst, I put in it a grain of *Opium*; notwithstand-
 “ ing which caution, it serv’d me the same way that
 “ the *Elixir Salutis* had done before, and I was re-
 “ lieved by the same means.

“ I was now, Sir, in a most deplorable situati-
 “ on; all things spirituous, all things sweet, all acids,
 “ all bitters, all aromatics, all foetids, in short, every
 “ thing that was capable of fermentation, or had ei-
 “ ther smell or taste brought on the pain with insup-
 “ portable anguish. I have said smell, and what is very
 “ surprizing, any effluvia, that struck the olfactory
 “ nerves with any disagreeable touch, rais’d the pain
 “ in my stomach in an instant of time, and that with
 “ as high a degree of irritation, as any thing what-
 “ ever I could take into it. All violent action was
 “ death to me, and as I am in a way of life; that
 “ obliges me to be much on horseback, as sure as ever
 “ I mounted, so sure the pain came on. Walking a
 “ few hasty steps would do the same: any motion
 “ whatever, that shook the stomach, and put the
 “ *fomes* of the disorder into action, had the same ef-
 “ fect; and what is not well to be accounted for, (if
 “ the *fomes*, as I take it, consisted in a fiery, caustick,
 “ vitriolic drop, that sour’d and fermented every
 “ thing taken in) Milk all along agreed better with
 “ me than any thing else; and indeed was now my
 “ sheet-anchor, as I could take nothing but it boyled
 “ with bread, without immediate torture; but that
 “ in the end failed me, so that I was absolutely in
 “ despair;

“ despair ; not to take some nourishment was death,
“ and whatever I could take for the support of life,
“ was worse.

“ Some worthy gentlemen in the province of Phy-
“ sick, offered me their assistance ; but I cut them short,
“ by telling them, if they could order me any thing
“ that had neither smell or taste, I would take it ;
“ otherwise, I was determin'd to die as free from pain
“ as possible ; nor did any of them, as they told me,
“ in the course of their reading, or practice, ever
“ meet with a similar case. As I have taken some pains
“ to be acquainted with medicine, and the Animal
“ Œconomy (tho' I practise only in the Chirurgical
“ way) I was doubly diligent in searching after means
“ of relief, when one day from a hint I took in read-
“ ing *Pitcairn's Lectures*, I tried the *Tinctura Martis* ;
“ which gave me unexpected ease, and for a few days
“ I flattered my self, I had found out (if I may so
“ say) a specifick remedy ; but alas, that hope was ill
“ grounded, for in a week, the pain returned with
“ greater violence than ever, and the Tincture that be-
“ fore gave me present ease, now upon tasting, rack'd
“ me to death. As all things spirituous, tho' in ever
“ so low a degree, brought on the torture in my sto-
“ mach, I apprehended that the Steel's disagreeing
“ with me, might be owing to its spirituous *menstruum*,
“ which put me upon trying the *Swadlingbar Chaly-*
“ *beate* water ; but the hope I conceived in the use of
“ this water, proved abortive ; for upon trial, it serv-
“ ed me like every thing else. I likewise tried Tar-
“ water, but I severely paid for it. Another time I
“ made use of Coffee, as I looked upon it to be of
“ an absorbent quality, but it served me just as the
“ Tincture of Steel had done before.

“ I had almost forgot to tell you, I made use of the
“ testaceous powders for a considerable time, but to no
“ purpose ; and at last was oblig'd to discontinue them,
“ as they made me worse. I should likewise have told

“ you, the pain in my stomach was generally attend-
“ ed with great *Flatus*, not with any great inflation
“ of the ventricle, but with a violent pricking pain
“ on the region of the *Pleura*, mostly on the left
“ side; violent pains in the hips, as in the *Sciatica*,
“ in the shoulders as in the *Rheumatism*, and often ex-
“ tended to the basis of the *Occiput*, to the origin of
“ the nerves, and there fix’d with the acutest pain, and
“ affecting my head to that degree, that I have often
“ thought it would end in a fatal *Apoplexy*.

“ Thus the Tragedy would continue three, four,
“ and sometimes five hours, and then subside, until
“ there was fresh matter collected for its repetition;
“ so that in the rotation of every twenty-four hours,
“ I was at least twelve, or oftener sixteen hours, in
“ the most excruciating torture. I before acquainted
“ you that cold water brought on the pain; but I must
“ now observe, that when warm alone, or mixed with
“ Milk warm, it was my only relief; for upon drink-
“ ing a quart, or sometimes two, and letting it lye
“ on my stomach, it would in a short time, often
“ give me ease; and I am convinced, where it can
“ be brought to agree with the stomach, which may
“ be done by beginning with small quantities, and in-
“ creasing them by degrees, it is the strongest Diu-
“ retick or Piss-driver, that ever entered the habit;
“ nor do I believe, that the whole *Materia medica*, can
“ furnish any thing equal to it, in that intention;
“ for nothing passes off so soon, or so forcibly by the
“ kidneys, as I have often found by experience; I
“ have sometimes had three quarts in my stomach to-
“ gether, when in a short time, it has come off by
“ the urinary passage in a double quantity, and that
“ with such violence, that the pain in my kidneys
“ and ureters, has been during the evacuation, little
“ inferior to a violent *Lumbago*.

“ What I think very remarkable is, that for a
“ year or more, I could lye on my back only; for if
“ I lay

" I lay on my right side, it rais'd the pain, and if I
" lay on the left, the stroak of my heart was so strong,
" that from the sound it made in the cavity of the
" *Thorax*, I could not sleep; and the circulation of the
" blood, notwithstanding my low living, was stronger
" during my illness, than ever I had known it before,
" which was manifest by the touch, as well as by the
" pulsation of the carpal artery, being visible at a con-
" siderable distance.

" I had thrice a remarkable vomiting, which was
" nearly periodical once a month, the last of which was
" in the interval of my discontinuing the *Swadlingbar*
" water, (as shall be remarked hereafter) but as I think
" it an uncommon Case, I shall give you the particu-
" lars. I had been one day abroad on horseback, and
" was seized with the pain as usual, upon which, as
" soon as I alighted, I threw in a vomit of my hypo-
" Wine; after the operation, I spent the day with-
" out any return of the pain; about nine at night,
" I went to bed, and took an anodyne *baustus*, as
" usual, to secure a night's rest and freedom from
" pain; but in less than two hours I was attack'd with
" one of the severest fits I ever had; the torture was
" so great, that I was obliged to have recourse again to
" my Wine, which instantly brought up near two
" quarts of stuff in colour and consistence resembling
" the grounds of Coffee, which immediately separa-
" ted; a *Coagulum* of a glewey contexture, not easily
" divided, floating in the more fluid part; and al-
" though I drank water in a great quantity, the ejection-
" s were discoloured to the last, and notwithstand-
" ing, I likewise next day began to drink the *Swad-*
" *lingbar*-water again, and took a smart dose of *Glauber's*
" Salts, yet the same kind of stuff ran through
" me for three days after, even upon a repetition of
" the Salts, which I must observe wrought very kind-
" ly, without giving me the least disturbance in my
" stomach, contrary to every thing of the purgative

“ class that I had made use of before. From what I
 “ have told you, Sir, you may believe that life in the
 “ main was insupportable, and I assure you, I have
 “ often thought death more eligible, and was ready
 “ to lay down the weary burthen.

“ Several of my Friends here at *Swadlingbar*, were
 “ daily teasing me to try the water, but in vain, for
 “ (as I observed before) all offensive smells raised the
 “ pain as well as taste, I could not therefore be pre-
 “ vailed upon, as I was well (as I thought) assured,
 “ that the very smell of it would rack me to death,
 “ until very luckily, for me, a gentleman of fortune
 “ came to try the water for the heart-burn, as it is
 “ called, of which he was very ill, but the complaint
 “ was soon happily removed by it; this gave me cou-
 “ rage to try it, when behold upon taking the first
 “ draught, I thought my self (if I may use the expres-
 “ sion) in another world; for it gave such a pleasing
 “ sensation to my stomach, as is not to be described;
 “ I continued drinking of it for about fourteen days,
 “ (taking generally two quarts in the morning, and
 “ one or two in the afternoon) the three or four last
 “ of which it began to lose its efficacy, and create the
 “ pain; (however I was much better in the main,
 “ and could eat and drink things without much dis-
 “ turbance, which before gave me excessive pain;)
 “ whereupon I discontinued its use for about three
 “ weeks, when that vomiting of a matter resembling
 “ the grounds of Coffee, attack’d me as before men-
 “ tioned, upon which, I began its use again, but
 “ with this difference, that I always drank it warm (a)
 “ which had the desired effect, and established a hap-
 “ py

(a) *N. B.* If the water be reduced to the degree of blood warm, or that degree at which water is usually taken in the operation of Emeticks, by roasting or gradually turning it at a convenient distance before the fire, in a bottle well corked, the sulphureous parts will be preserved without loss, as is demonstrable from the water

“ py and lasting cure ; for from the first draught of
 “ it taken warm until this time (which is more than a
 “ year and half) I have never had the least twitch in my
 “ stomach, but have eat and drank every thing that
 “ came in my way without any ill effect ; and tho’
 “ I was emaciated to the last degree, I soon recovered
 “ my loss of substance with my health, after a sur-
 “ prizing manner ; and although I am now turned of
 “ fifty years of age, I never enjoyed more vigour of
 “ mind and body. If I have any complaint to make,
 “ I am (if it is not a paradox) too well.

I am without Ceremony

S I R,

Your assured Friend,

JOHN ODBERT.

Near *Ballyconnel*,

August 1752.

In diseases of the Skin these waters have abundantly signalized their great efficacy. *Baccius* indeed, in reciting several of the sulphureous waters both hot and cold, observes as a known fact, that they were eminent in the cure of the *Scabies pruriginosa* in bathing ; but the use of our water in disorders of this kind has been chiefly internal, and tho’ it be a light water, and less strongly loaded with Sulphur than that of *Harrigate* in *Yorkshire*, and even than some in this kingdom in its own neighbourhood, its effects are very considerable, even as several of the cold sulphureous waters recited by *Plot* and *Short*, particularly those of *Loansborough*, *Wardrew* and *Codsalwood*, which agree to our water of *Swadlingbar* in their lightness, and in the small quantity of their contents, are eminent

B b 3 in

water smelling much stronger of them when warm ; but in this method, it should be drank quicker, as the warmth will make these parts evaporate the sooner.

in the cure of the Mange in dogs and horses, and of the Leprosy and Ulcers in mankind, partly by external, and partly by internal use.

Of the good effects of drinking the *Swadlingbar* water in removing the most stubborn eruptions on the Skin, whether white, scurfey, scaley, dry or moist, or ulcerous, or even some of the tetters kind, which last *Guidot* observes not to give way to the *Bath* waters, the instances that might be produced are almost innumerable, and several of them where a mercurial Salivation proved ineffectual.

Scholium. In rebellious disorders of the Skin not evidently venereal, it seems far more eligible to begin with a course of these waters than with a mercurial Salivation, the first being always safe, and for the most part effectual, whereas the last harrasses and enfeebles the constitution, and frequently to no purpose; and moreover in cases truly Scorbutic is almost universally condemned by the best authorities.

I proceed now to relate several well vouched facts, in order to establish the truth of this observation, tho' it is worth remarking that in some of these cases the water was used for at least two seasons successively.

The first testimony is from a gentleman of veracity in these words:

S I R,

“ MY ailment began with a breaking-out on my
 “ forehead, and several other parts of my body,
 “ with pains in divers places, as in the Rheumatism,
 “ but chiefly affecting my head, tho' various
 “ medicines were used for the removal thereof, and
 “ at length the warm Bath; after which I went to
 “ *Swadlingbar*, and drank of the water four or five
 “ pints every morning fasting, and again in the afternoon,
 “ interposing exercise. I drank the water
 “ thus about five weeks, which remov'd all my pains
 “ and

“ and gave me wonderful Spirits ; which is a general
“ effect of the water.

“ They operate a little by perspiration, and some-
“ times by stool, but chiefly by urine ; they general-
“ ly begin to pass in less than half an hour after
“ drinking, and that most fluently. They are ex-
“ cellent in all breakings-out, of what kind soever.

“ Your humble Servant,

Lisgool April 14, 1743.

“ I. A.”

Another cutaneous disorder tending to a Leprosy, and accompanied with a stiffness in the joynts was also removed by drinking this water.

A woman troubled with Boils dispersed over her body, with an irregularity in her menstrual discharge, was restored to a due regularity in this respect, and her Skin cleared by drinking it.

An inveterate Itch not yielding to common remedies, and threatening an Atrophy, was cured by drinking these waters two summers.

A. D. 1750. A Lady aged thirty-seven, of a delicate and weakly fabric, had been subject for several years to colic pains, *diarrhœa*, and sometimes hæmorrhoidal fluxes, which being cured by astringents, were succeeded by a burning heat in the head, and especially behind the ears, attended with a preternatural hardness, and a large watry discharge, and great itching, with small suppurating pustules in the face.

Bleeding and purging having been premised, she was dismissed in *June* to the waters of *Swadlingbar*, the drinking of which at the beginning was attended with a foulness in the urine, obstructing their passage that way, until she took them in bed, whereupon they first excited a copious sweat, and afterwards passed freely by urine. She gradually increased her daily dose from four to six or seven pints, and applied the water externally to the parts affected ; and on her persisting

persisting in the use of the waters for three months, the flux dried up, the natural softness of the parts returned, and the Pustules vanished, and she acquired vigour of spirits and digestion.

The same Summer these waters proved equally successful in a Cutaneous disorder of some years standing, viz. in a young woman, who, on a fright some years before, was seized with a great horror, which was followed by broad, white, scurfy Blotches on the Skin, red and hot underneath. She had tried most of the common remedies, particularly the wood drinks, lotions and mercurial applications externally, but still her disorder returned every spring and fall. She was cured by drinking these waters, without any return of her disorder the following spring,

I am also assured, that some of those rebellious disorders called Tetters have given way to drinking this water, particularly a *Rose* in the leg was cured there, *A. D.* 1748. being a round tetters eruption, red and itching, so called from its colour and figure resembling a *Rose*: and

A Ringworm broad and round in the face of a young Lady, which used to return every quarter of a year, gave way to the sole internal use of this water.

A. D. 1750. A leprous scurf on the palm of the hand was cured by it; and in this as well as several other cases of the like nature it was observed at first to increase the eruptions.

A. D. 1753. *Philip Shannon*, aged twenty-four, on no occasion known but vicissitudes of heats and colds, being a labouring man, fell into almost as great a degree of the Leprosy as has been ordinarily seen here, being a frightful spectacle, covered with white Scales over all his body, attended with itching. He went to several of the hospitals in *Dublin*, from whence he was dismissed first to the Sea water, in which he bathed and drank a pint in a day for three weeks, which threw out the disorder on his Skin more abundantly,

dauntly, and moreover to this there supervened pains in his limbs. He was therefore sent to *Swadlingbar*, where he staid from *June* till *Michaelmas*, drinking the water frequently to seven quarts in a day, and making it his common and only drink all day. Its good effects soon appeared, and he returned to *Dublin* with a smooth and clean Skin, which also continued *February 27, 1754.* when he gave me this relation.

It is allowed that that species of the Leprosy which is described under the name of *Lepra Græcorum*, is still found subsisting among us, tho' much more rare than formerly. I shall subjoyn two instances of the efficacy of our water, in a high degree of this disease even such as seemed to make some approach towards the *Elephantiasis* or *Lepra Arabum*.

The first came under my own inspection, the second is from the relation of the patient himself, a person well known among the physicians and surgeons of *Dublin* many years ago.

I. A. D. 1744. ----- *Martin* : He had been a patient in *Stevens's* hospital in *Dublin* : his Skin was universally hard and thick, and the nails of his fingers and toes at their extremities were increased to a thickness six times greater than in the natural state. The Skin of the face, trunk and limbs was covered with a white Scurf and Scales, attended with great itching. He had been salivated with some relief, but his disorder returned again. He took Tar-water without relief.

May 25, he began to drink the Decoction of *Guaicum* to a gallon in a day previous to his sweating in the chair, which he did for about the space of a month, first twice, then once in a day : whereupon his Skin grew softer, and his Nails returned in some measure to their natural state : But

July 4, soon after he had left off sweating, his Skin grew rough again : he was therefore dismissed to *Swadlingbar*, and drank largely of the water, first to
six

six pints, and then a gallon every day, which passed freely by urine: he was also purged with the Salts every three days during this course, which lasted but three weeks, when he was entirely recovered: however, in order to confirm his cure, he went to *Meelock*, a place in the neighbourhood, where is another sulphureous water, stronger than this, which moved him to stool a little more than the *Swadlingbar* water had done.

October 16, being one of the grateful Lepers, he returned to the same Hospital, from whence he had been sent to these waters, in order to shew himself, when his Skin was restored to its natural softness, his nails were become thin, his face florid, and he had all the marks of health.

2. *Luke Butler*, aged forty-eight, had been several years troubled with tumors in the face, hands and feet, not attended with much heat or acrimony until they ulcerated, when the humor was so sharp, that wherever it seized, it commonly eroded to the bone, and in consequence hereof he lost some part of his nose and fore-finger.

The Ulcers from their obstinacy, were by some of the best Surgeons who attended him, pronounced cancerous, which appearance, and the corrosion of the bones are symptoms recited by *Aretæus* and others in the *Elephantiasis* or *Lepra Arabum*, a disease proper to the hotter countries of *Arabia*, *Syria* and *Egypt*, even at this day, but not found with us. (a)

He used various medicines, underwent three Salivations to no purpose, and took the Decoction of

Guaiaicum

(a) But the *Lepra Græcorum* is found here and curable by this and other waters of the like kind, and particularly by the *Aqua Bollenses*, both by external and internal use; as *Baubini* observes; and at the same time, after a long enumeration of the most eminent of the medicinal waters of *Europe*, he professes he does not know any one of them that cures any Cancer whether occult or ulcerated, and much less, adds he, the *Elephantiasis*, which is an universal Cancer.

Guaiacum with no better effect, than that this last seemed to put some check to the progress of the disease. Some of the tumors were at length extirpated by means of the potential cautery by an Empiric, but the vicious habit of body not being corrected, the tumors and ulcers continued to revive and spread, sometimes in one part, then in another.

In this deplorable condition, and wearied out with medicines, he was abandoned to the last shift, the use of the waters, and in the year 1737. went to *Swadlingbar*, and staid there ten weeks, and drank two gallons of the water in a day, and sometimes washed his face with the water, and every three or four days took some purging Salts. Whilst he was there, he felt only this advantage, that his appetite and strength were increased, and he had a greater alacrity than usual, but his tumors and ulcers still continued: wherefore, at the end of the ten weeks he went to the celebrated *Lough Lbeighs* (a) in the county of *Cavan*, and spent another ten weeks there, bathing in that water and drinking it all that time, but his disorder still continued without any alteration, until about a month after his return home, when on a sudden he began to find the tumors to subside, and thenceforward gradually recovered, the parts cicatrized and have now continued sound and firm these two years, to the year 1739, when I received this relation. He repeated the use of the *Swadlingbar* water again in 1738 in order to confirm his cure, with an event agreeable to his wishes; and indeed there is great reason to impute his cure chiefly to these sulphureous waters, rather than to the Lough water, because it has appeared by several observations that the cures performed in ulcers by the waters of the Lough above mentioned, did not continue as his did, but the patients commonly relapsed into as bad a state as before.

I proceed next to give some account of the effects
of

(a) See the History of this water in the first Book.

of this water in a certain stubborn disorder of the bladder and urinary passages, in which it hath also not less distinguished its great efficacy.

The good effects of Sulphur, and of the waters therewith impregnated, in healing ulcers both by external and internal use, have been elsewhere noticed; and the waters of *Fonsanche* in *Languedoc*, much resembling ours in the quality of their impregnating minerals, are said to have healed ulcers in the bladder, and the cases I am about to mention wherein the good effects of our *Swadlingbar* water have been experienced, have commonly passed under this denomination, whether altogether justly I shall not take upon me to determine, but describe the distemper and leave the denomination of it to be settled by Critics.

It must indeed be owned, that in these cases the discharge was chiefly slimy, the far greater part at least such, and not purulent, nor did it appear that an inflammation and abscess in the parts had evidently preceded. However, the Bladder being chiefly of a membranous substance, except about its neck, can yield but little real *pus*, tho' indeed some vestiges of it seem to appear in the following cases by the yellowish tincture sometimes observable in the discharge, and sometimes in a mixture of a little blood, and sometimes little pellicles, besides the slime or natural *mucus* of the bladder, which is here discharged in large quantities, even as ordinarily happens from the irritation of a stone, and may also arise from a meer acrimony of the humours thrown off this way: that here is however a corrosion and a *Solutio Continui* in these cases, and that they proved equally untractable to medicines as real Ulcers of the Bladder, no ordinary medicines taking place in their cure, and consequently that our water lays claim to a superior balsamic, healing quality appears from the following histories.

I. A man aged forty had great pain in his back, and in making water, and an almost perpetual forcing

to

to it, so that he could scarce retain it at all: he discharged a vast quantity of slime in his urine resembling the whites of eggs: he was emaciated and hectic, had horrors and night sweats, as in the last stage of the *tabes*; he had gone through the common course of medicines, and among the rest taken Cantharides, all to no purpose: He was therefore abandoned to these waters, of which he drank ten pints in a day, which passed by urine, and he drank the purging Salts once in three or four days during this course. In the space of three days he found himself to begin to be able to retain his urine a little better, and in about four weeks recovered strength, grew fat, and returned to *Dublin* (a journey of seventy miles) in two days.

The second instance was also of a middle-aged man troubled likewise with an incontinence of urine and a discharge of slime: he recovered on drinking this water for two summers successively.

The third case proved not altogether successful through mismanagement, but however is an evidence of the healing efficacy of the water, *viz.*

A. D. 1743. A poor man aged forty, had long laboured under the following complaints: a discharge of blood by urine, as also of a matter resembling curds or hardened slime, which last was constantly voided with his urine, which had a fetid smell like that of Onions; he had a very frequent irritation to make water night and day, not being able to retain above two ounces at a time: withal he had sometimes a pricking pain about the beginning of the *Bulbus Urethrae*. Under these circumstances having tried many medicines to no purpose, he went to this fountain this summer, and drank six quarts of the water in a day, and was sometimes purged with *Glauber's Salt*, but by reason of his poverty, was not able to stay there above six weeks, and indeed whilst he was there, he scarce found any sensible relief, the discharge, at least of blood continuing as before, but since his return home

home, the discharge of blood entirely ceased for many months, from whence being convinced of the healing virtue of these waters, he the following summer returned to them, having then partly the same discharge as before, except that he voided less blood. He was then advised by his physicians to spend the whole summer there, as the least he could do to effect a compleat cure of that stubborn disorder; but, unfortunately for himself, he staid there only five weeks, drank a gallon of the water in a day, and sometimes took a dose of the purging Salts: however, in the space of three weeks his urine became entirely clear and void of the matter above described. It is true the frequent irritation to make water returned on him some weeks after his leaving the waters, as also the discharge of the matter above described, altho' not above half the quantity he had usually voided before, and he could retain three or four ounces of urine at a time. At the well he voided a large clot of blood, having otherwise of late been entirely free from any discharge of blood. I saw him walking the streets of *Dublin* frequently ten years after, tho' not yet free from his disorder; it seems however highly probable, that had he spent two whole summers at these waters from the beginning of his complaints, his cure might have been completed.

I met with three more cases similar to the foregoing, and attended with a like success, the description of which, I for brevity's sake omit; but the following seems to deserve a minute account, being a signal cure which gave no small reputation to these waters.

May 21, 1748. A man aged forty, of a previous bad state of health, having been formerly subject to severe Colics, and afterwards to the Gout, and given to hard riding, had for four months laboured under the following complaints: a very frequent irritation to make water depriving him of sleep, an acute pain and heat, especially before, in and after making water, extended

tended from the region of the neck of the Bladder to the *Glans penis*, where there was also a frequent itching, and he had sometimes a tenesmus: the pain was increased by brisk walking or riding. The urine was thick, like milk and water, and sometimes very slightly streaked with blood, not fetid, but always deposited a thick mucous sediment, white and yellowish: sometimes there was a substance like bran on the top of the sediment.

In order to discover whether he had a stone, the Catheter was introduced, by *Joseph Butler* Surgeon, (a faithful and worthy Associate of mine in many occurrences in the practice of physick and surgery) and no stone was found, but a callosity on this side the neck of the Bladder, which was also sensible by the finger *in ano*.

Emollient and agglutinant medicines having been used, both by the mouth and injection, as also vomits, purges and paregoricks with very little effect, I dismissed him to these waters the 3d of *July*, of which I ordered him to take a pint and half in a day, and gradually increase the dose, as it should be found to pass, to a gallon or ten pints, and to take night and morning during this course an Electuary of boiled Turpentine. G. arabic and G. tragacanth with a little *flos Sulphuris*, and lenitive electuary washed down with the infusion of *Veronica*; and an infusion of *Sena* once in eight or ten days.

He had not drank the waters nine days (at the expiration of which he drank six pints in a day) until he found a sensible alleviation of all symptoms, his pain much less, and he could walk or ride a mile or two almost without pain.

August 7. Some pustules were thrown out on the feet and ancles, attended with great itching and going off with scales.

August 20. All pain ceased, as also the mucous discharge

charge vanished; he drank lately a gallon, and afterwards twelve pints in a day.

September 25. He returned to *Dublin* free of all complaints, and could retain his urine as in health, and walk and ride without pain. The hardness on this side the neck of the bladder also vanished; and near the end of this course he voided certain pellicles in his urine, which was then otherwise clear.

He continued free from all symptoms of this disease until his death, which was some years after, and was the consequence of a feverish disorder contracted by cold.

A man of about thirty years of age, had, for nearly the space of a year, been attacked commonly once in a month, six weeks, or two months with a shivering, sickness and vomiting, which was followed by a great heat, and a great irritation to make water, and pain in the region of the *urethra*, which continued until he discharged by urine a large quantity of a glairy matter, prodigiously viscid, and yellowish and mixed with a little blood.

Having taken divers medicines without the desired effect, he went to *Swadlingbar* in *August* 1753. and drank the water for a month, and had no return of the discharge since, even to the 23d of *December* following, tho' a little heat of urine lately, and drinking the water in *Dublin*, the following summer, he continued to enjoy a much better state of health than before.

A kin to the foregoing cases is the following, which was communicated to me by a Surgeon of eminence.

A middle aged man, and patient in *Stevens's* hospital in *Dublin*, laboured under the strangury, tenesmus, and the like glairy discharge, as in the foregoing instances, by which he was greatly emaciated. He was searched for the stone, and none found; and his disorder proving intractable to common medicines, he was dismissed in the summer 1756. to *Swadlingbar* water, where, thro' extreme poverty, he was unable

to stay above a month : however, he returned greatly relieved in all symptoms and recovered his flesh, and purposed to have recourse to the same water again the ensuing summer, in order to compleat his cure.

To these I shall add one observation more from my ingenious Correspondent above mentioned, *I. O.* who besides his having studied Physic to good purpose, has also been conversant in the practice of Surgery, tending to shew that the water is possessed of a general balsamic and healing virtue, in external and internal use, *viz.*

“ *Joseph Read*, had a most stubborn and frightful Ulcer in his buttock, and corrosive to that degree, that a great part of the flesh was consumed : It had baffled the ordinary methods of cure, and particularly a Salivation in one of the hospitals in *Dublin*; but was at length cured solely by drinking *Swadlingbar* water, and bathing the part with it.”

The balsamic, healing quality of our water in general, and particularly with regard to discharges of slime and blood from the bladder and urinary passages, whether from Erosions or Ulcerations, being thus far established by observations and undoubted facts, it will be no useless transition to consider how far it may be of service in Coughs, Defluxions on the Lungs, and discharges of Phlegm, Pus or Blood from thence, or in Consumptive cases.

On the one hand, a prejudice having been entertained of the powerful heating quality of Sulphur, especially when combined with an alkaline Salt, joyned to the positive observations concerning the celebrated Sulphureous water of *Moffat*, being very hurtful in Coughs, Tubercles, and all infarctions of the Lungs, should seem to render the use of our water very suspicious in these cases ; but on the other hand, it may be alledged, that the theory of the extremely heating quality of Sulphur seems not to be well founded, or at least not to be applicable to the state in which it exists

ists in our water, viz. in a very small proportion with respect to the great bulk of the watery *Menstruum*, and that the native alkaline Salt herewith combined is void of the fiery acrimony of the artificial Alkali, besides that it impregnates the water also, but in a very small proportion; to which add, that the waters of *Fonsanctæ* in *Languedoc*, which are impregnated with the same minerals as ours, have been found by observation to be of benefit in Ulcers of the Lungs: all which may tend to lessen our suspicions of the use of our water in Consumptive cases; especially if to this be added the observation of Dr. *Short* in the first Vol. of his History of mineral waters, p. 314. 315. concerning the water of *Harrigate*, (which is not only strongly Sulphureous, but also much more strongly impregnated with marine Salt than *Moffat* water) viz. "That it has been frequently used with success, even in ulcerated Lungs, and in Hæmorrhages in thin consumptive bodies." From whence one might incline to suspect, that the accounts of the *Moffat* waters may deserve further enquiry.

It must be confessed, that Ulcers of the Lungs are a well nigh deplorable case, and that death alone cures the *Phthisis* in the last stage; but that violent Coughs attended with pain and streightness of the breast, loss of flesh and appetite, and other circumstances proper to the *Tubes*, in the first, or even the second stage, have been partly mitigated, and some of them entirely removed by our water, may appear from the following cases communicated by my worthy Correspondent above mentioned, and interspersed with some remarks not unworthy the attention of physicians, which I shall here subjoin, in order to remove the prejudices, which might otherwise be a means of depriving many of the benefit of these waters, under such circumstances of these disorders as are not altogether deplorable.

1- A woman aged about twenty-six, and mother of several children, in the spring A. D. 1751. was extremely

tremely ill of a violent Cough, shortness of breath, pain of the side, and loss of appetite and flesh, threatening an approaching Consumption: these symptoms were gradually aggravated until she drank our water the summer following, by which in a short time she was surprizingly relieved of all her complaints, and now *August* 1752. enjoys a perfect state of health; and what is remarkable, the nervous system, (which seemed in her to be weaker than in most of her sex, some affections of the hysteric kind, having appeared in her at the age of seven or eight, and increased with her years) since her drinking the waters, is strengthened to that degree, that she has not had the least complaint of that kind since.

2. A gentleman with his family came to our water in the year 1752. they had all violent Coughs which had been contracted a good while before, and in one of them attended with a great shortness of breath; they had not drank the water above three weeks before they were all entirely freed from their Coughs; and it was observable that some of them, besides their Coughs, had been very irregular in their menstrual discharges, which were hereupon restored to their due periods.

3. A gentleman late of *Swadlingbar*, had for some years laboured under a confirmed *Phtisis*, and was strictly forbidden by his attending physician to drink the water: nevertheless he resolved to try it, and finding it to agree with him, he drank it for some seasons, and found himself much better, upon so doing, especially as to Spirits and Appetite; and altho' the disease was so rooted as not to be conquered, yet the water was supposed to keep him alive much longer than it was expected he could have lived without it.

4. A widow aged thirty, from a Catarrh fell into a consumptive Cough, causing a rejection of her food by vomiting, and attended with loss of flesh, strength and appetite, and with night sweats. She was imper-

fectly recovered by the country air, and the use of the juices of *Dens leonis*, *Hedera terrestris* and *Bellis major*; in which state she accidentally went to *Swadlingbar*, where she was forbidden to taste the waters by her physician, from a supposed similarity of their effects to those of the sulphureous waters of *Moffat* in *Scotland*. However she drank them in the year 1751. beginning with a pint, and increasing the dose gradually to a quart every morning, and took the same quantity in the afternoon, and persisted in the use of them six weeks, and they were far from renewing her original disorder, but gave her appetite and spirits, and she continued to be much better in the year 1752. and contracted matrimony a second time.

5. A. D. 1752. A young woman in the twenty-third year of her age, healthy before, some rheumatic complaints excepted, but of a family to several members of which the *Tubes* proved fatal, about three months ago, by overheating her self in walking, and getting cold by riding in the night after it, was seized with a violent Cough, a pain in her side, and loss of complexion and appetite.

An *Hæmoptoe* followed, which became periodical, returning once a month in lieu of the menstrual discharge which was suppressed, of which return she was sensible by a pain in the right breast; which ceased upon her throwing up the blood, until the return of the next period. The blood was sometimes mixed with purulent matter, and this last mentioned discharge consisted partly of a laudable white *Pus*, but in the mornings, it was very fetid and salt, which saltness continued for the space of a week, and then by intervals, it became very sweet.

Besides this, a dry Gripping attended her by fits, almost from the time of her first complaint, especially after eating any thing whatsoever, with great inflation of the belly and stomach.

About

About the middle of *August, A. D. 1752.* bleeding having been premised, she began the use of our water, drinking a quart of it in the morning, and the same quantity in the afternoon, for the space of a fortnight, without any other effect than mending her appetite: but it is worth observing, that by mistake or persuasion, she for four mornings, instead of the Sulphur water, drank of the Chalybeate in that neighbourhood, which increased both the Cough and Defluxion after an extraordinary manner, and brought on profuse night-sweats, with constant watching, which greatly weakened her; but upon her returning to the use of the Sulphur-water, the sweats were checked, the defluxion lessened, and the cough abated, her sleep returned, as also her strength and appetite mended.

It was also observable, that the above mentioned dry Gripping with inflation of the belly and stomach immediately vanished upon her drinking the water, but upon her discontinuing it, returned:

October 1, the weather proving good, she went again to *Swadlingbar* for the benefit of drinking the water at its source, where she continued it a week, with good effect, mending in her appetite, and growing stronger; but unluckily, a certain person calling to see her, prevailed on her to repeat the same error she had been guilty of before, *viz.* to change the Sulphur-water for the Chalybeate, which again enraged the symptoms, and brought on the *Hæmoptoe* to that degree, that she threw up more blood than she had done before; upon which, she returned to the Sulphureous water, which soon again set matters to rights; and on the 29th of *October*, she was much mended in colour, appetite, strength and spirits, but still had no return of the menstrual discharge. What she then spit-
ted, was a greenish yellow *Pus*, extremely fetid, but in less quantity:

She died suddenly afterwards, *April 28, 1753.*

Scholium. See here a very instructive error, and strong instance of the superior, soft, balsamic quality of our Sulphur-water, in an Ulcer of the Lungs, compared to the effects of the Chalybeate water in the neighbourhood in the same case, as indeed most Chalybeate waters have some acid, more or less in their composition, of which our water is nearly free, and besides its Sulphur and absorbent Earth, is constantly impregnated with a native alkaline salt, mildly detergent, and free from the heat which the artificial *Alkali* acquires by the fire.

Moreover, whereas *Morton* attributes a very powerful efficacy to Chalybeate waters in the cure of the *Phthisis* from glandular tumors and infarctions of the Lungs from a steatomatous or gypseous matter, it is certain, that this and other waters impregnated with the native *Alkali* and Sulphur, are a more powerful dissolvent, than the Chalybeate waters, and at the same time more soft and less irritating: and

From the above Histories (which have been further corroborated, by other similar observations of their salutary effects in other cases of the like nature, of a more recent date) I conclude that *Swadlingbar* water may be safely taken in the *Tubercles* far advanced, and may deserve a place at least among the palliative remedies in that case.

There are moreover several other diseases wherein our water has had remarkable good effects, and superior to other medicines, of which however as I am not furnished with the particular histories, I shall content my self with the bare mention of them, leaving these and other uses of this excellent water to further time and observation.

Thus several instances are given of its curing Barrenness in women, in common with other sulphureous waters: there are also instances of its removing obstructions of the Liver threatening an Abscess or Scirrhus, a virtue also attributed to other sulphureous waters:

waters: they have also been drank in order to destroy Worms with a probable prospect of good success, as it is said, that a common Earth-worm put into this water dies suddenly, and that the sulphureous waters in general are destructive to most Insects and Worms, both without and within the body.

I shall conclude with one important remark of Dr. *Short*, concerning the use of the Chalybeate and Sulphureous waters in general, viz. that it has appeared by late observation, (tho' *Henricus ab beers* had long ago affirmed the same thing of the waters of *Spa*, viz.) that the most notable and perfect cures have been effected by taking them in very large doses; and thus that the light Chalybeate waters, impregnated with a little Nitre, have done wonders in Coughs attended with an Hætic, being drank daily from six pints to nine for six weeks together, when smaller doses have not answered. To this agree the accounts given of the large doses, in which this water was also taken in the above instances of its happy effects; and accordingly the poor not unfrequently drink seven quarts or more of it in a day, in their leprous and ulcerous disorders.

S E C T. II.*D E R R Y L E S T E R Water*

HAVING been so far copious, in describing the operation and virtues of the hitherto most known and most frequented of our sulphureous waters, I shall now proceed to give some account of several other waters situated also in the northern parts of this kingdom, and several of them in the neighbourhood of the foregoing, which by all experiments manifest themselves to be similarly impregnated, and some of them more strongly than the *Swadlingbar* water, and consequently are in all probability, possessed of the like virtues,

tues, and may be allowed as proper *Succedanea* to be used instead of the other upon occasion: for tho' most of the next following waters have been but little used thro' the people's ignorance of their virtues, yet inasmuch as they yield the same appearances to our senses, and upon the mixtures of the same bodies with them, and are resolved into the same principles, as the *Swadlingbar* water, it will be no rashness for the physician, where the circumstances of his patient may require it, to substitute any of these for that, even as in our domestic Chalybeate waters, the general operation and virtues of which are the same, and their principal difference seems to consist in this, that some are more, others less strongly, impregnated with the same mineral; and the like may be said of the sulphureous waters of this Class.

Since then the bounty of Providence has supplied the northern parts of this kingdom with a considerable number and variety of the sulphureous waters, it were unexcuseable in a general History of the *Irish* medicinal waters, to omit a description and minute detail of the distinct qualities of each, to which I therefore now proceed, recommending the uses and virtues of most of them to further observation.

Derrylester lies a mile eastward from *Florence Court*, within two miles of *Kinawely*, and three from *Swadlingbar*, on the School-lands, in the county of *Fermanagh*, and near a mill, just on the road-side.

It is a very strong sulphureous water, exceeding that of *Swadlingbar*, both in strength and stream, and is more commodiously situated.

It continued flowing all the time of the great Frost, *A. D.* 1739-40. when all the great lakes, rivers and springs were frozen up for six weeks, when it was much stronger than usual by the observation of Dr. *William Henry*, who was one of the first enquirers into these waters, all other springs that might otherwise mix with it being then lock'd up.

I examined

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I examined this water at the fountain, *June 26.* at five in the evening, *A. D. 1739.* and again, by a specimen of it carefully bottled and waxed, *September 25, 1742.* which arrived in *Dublin, October 3.* following : the result follows.

It is of a bluish colour being viewed from above, of a fetid smell like that of *Swadlingbar*, but somewhat stronger, and had the flavour of roasted eggs, but that which had been exposed in a glass twenty hours, lost the smell and flavour.

It was somewhat lighter than distilled water ; for the Hydrometre stood in it at 5. 0 when in distilled water equally exposed, it stood at 4 $\frac{1}{2}$.

It lathered with Soap, tho' not without some previous curds , Oil of Tartar, Spirit of *Sal Ammoniac* and Lime water, all continued clear with it.

Oil of Vitriol and Spirit of Salt both made a minute ebullition with the water, and the solution of Alum exhibited a gross white grume.

The Experiments on the metals and their solutions manifest a strong sulphureous impregnation thus :

Tho' this well was not covered with an Arch, (as that of *Swadlingbar* was when I made the experiments in concert on both upon the spot) but exposed to the sun, the water at the fountain tinged a shilling immersed in it half an hour, of a colour somewhat darker than *Swadlingbar* water did ; and the specimen transmitted as above to *Dublin*, tinged Silver immersed in it a quarter of an hour, of a colour partly leaden, partly like that of copper, and partly yellow, with some blackish spots. The solution of Silver turned the water of the said specimen of a Sack colour, and withal exhibited a livid circle at the surface of the mixture, and a brown sediment.

The solution of Sugar of Lead exhibited with the last mentioned water the same appearances as solution of Silver.

The solution of *Englsh* Vitriol exhibited with the
water

water at the fountain a much darker colour than *Swadlingbar* water did, the mixture being almost thorough black when stirred up: moreover, the same solution with the specimen transmitted to *Dublin* struck a dark dun-colour almost black, with a blue circle at the surface of the mixture, and a dark brown yellowish sediment.

The colour of Gold was heightened, and Copper became redder on immersion, in the last mentioned specimen; and tincture of Gold struck it of the colour of *Madera* Wine, and precipitated a brown yellowish reddish sediment.

Upon the whole, this water has more powerful effects in discolouring metals, than the foregoing one of *Swadlingbar*.

On the other hand, it had less powerful effects on the tincturing articles, than the water of *Swadlingbar*: for Syrup of Violets rendered it only greenish at the surface of the mixture; Logwood gave it a crimson colour, Rhubarb a light orange-colour, Ash-bark exhibited a pale blue circle, and lastly, Galls extracted little or no tincture from it.

The Analysis.

1. *Spontaneous.* A white sludge like Magistery of Sulphur covers the Grasse and stones in its passage.

2. *Artificial.* During the evaporation of it, it was observeable, that it still retained the sulphureous flavour when exhaled to the consumption of half, tho' it did not then tinge Silver immersed in it.

A gallon of both the specimens above mentioned exhaled to a dryness, yielded thirty-two grains of a white sediment, of a brackish and urinous taste, like the sediment of *Swadlingbar* water:

It was actually warm on the tongue:

It turned of a deep and bright green presently with Syrup of Violets:

It

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It emitted a pungent and urinous smell when rubbed with *Sal Ammoniac* :

It made an ebullition with Vinegar, and a strong one with Spirit of Salt, and an ebullition with an acid fume with Oil of Vitriol :

It sparkled and stunk on the red hot iron :

The dry Salt separated from the indissoluble parts was brown, moistened in the air, was of an urinous and nauseously bitterly taste :

It made a great ebullition with Vinegar, even more than the indissoluble matter did, an argument of its stronger alkaline quality ; also it sweetned the Vinegar.

It melted on the red hot iron, burnt black, and stunk a little.

The Solution of this Salt in distilled water was of an amber-colour, and of the same urinous and nauseously bitter taste, as the substance : It continued clear with Oil of Tartar *per deliquium*, but precipitated a large white grume with solution of Alum : it turned presently of a bright green, with Syrup of Violets : Mutton steeped, and then boiled in it did not become red.

The indissoluble matter separated from the saline, was nearly half of the weight of the last ; it made but a small ebullition with Vinegar, and with Oil of Vitriol : it turned green with Syrup of Violets : it calcined very white, and then turned red with the solution of Mercury sublimate corrosive, but did not become caustic, nor impart the taste of Lime to water.

Corol. *Derrylester* water is impregnated with mineral Contents of the same quality in general, as the preceding water of *Swadlingbar*, but in a little less proportion : it is however a little stronger of the Sulphur, its predominant salt also is Alkaline, tho' the brackish and bitterish taste joyned to the urinous, together with its moistening in the air, seems to indicate a pittance of marine Salt and calcarious Nitre, combined with a terrestrial matter partly of the absorbent kind,

kind, and partly of some other sort, the determination of which must be left to further experiments.

As to the operation, I have hitherto learned only thus much from observation, that if taken in large quantities, it vomits and purges; but as it contains the same principles, so it probably is possessed of the same virtues as the foregoing water of *Swadlingbar*; and equally bears transportation to remote places, retaining its sulphureous quality entire, at a distance, as at *Dublin*, provided it has been well bottled and corked; and were such waters situated as near *London*, I doubt not but they might find a place at their mineral water ware-houses there, at least if their virtues were as well known there as here, which indeed they do not seem to be, since we do not ordinarily find any of the sulphureous waters in their Advertisements.

S E C T. III.

The two Springs of LISBLEAK.

IN the neighbourhood of the two foregoing are found two other springs of the same sort, which I shall next give a distinct account of, as an instance of the frequency of these waters in these northern parts.

The Land or Farm of *Lisbleak*, is in the parish of *Killashber* in the county of *Fermanagh*, part of which Farm joyns the *Aurney* river, being that which passes under *Derrycorry-bridge*. Now the first of these springs lies about two miles up the water from the said bridge in a meadow, about eight perches from the foot of a low hill in the said Farm, and within a perch of a rivulet, north from *Bin-aughün* three miles, near the house of *Robert Tremble*, and on the estate of *Henry Green*, Esq; and is preferable to the second on this account, that it is seldom overflown.

The water of this spring was carefully examined
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at the fountain by my faithful Correspondent *James Leonard*, Mathematician at *Lisnaskea*, to whom the publick is greatly indebted for his care and accuracy in examining at their respective fountains most of the following sulphureous waters, as well as faithfully collecting and transmitting the several specimens of them to *Dublin*; to whom also we owe the description of the situations of these several springs.

The first spring then of *Lisbleak* above mentioned, yields a strong sulphureous water, as appeared by the smell and flavour of it at the fountain, and in a specimen of it bottled *September 18, 1743.* and examined in *Dublin October 15.* following.

A piece of Silver immersed in it, for half an hour at the fountain, was tinged of a deep blue, and of a deep copper-colour; and in the specimen examined in *Dublin*, it tinged Silver on a quarter of an hour's immersion, of a copper-colour and black, and the solution of Silver mixed with it exhibited a brown yellowish cloud and sediment, and a livid circle at the surface of the mixture; and solution of Sugar of Lead, yielded much the same appearances as solution of Silver; and solution of Copperas turned it black, and exhibited a dark coloured sediment; from all which, it appears to be at least equally impregnated with Sulphur with the *Swadlingbar* water.

Besides the Sulphur, and the Salt, whose nature will be shewn in the sequel, this water has but few other contents; for the Hydrometre stood in it at the same height as in distilled water, and Soap lathered smooth with it, even without any previous curds, which the *Swadlingbar* water did not, and accordingly also the solution of Salt of Tartar exhibited no cloud or whiteness at all with it, whereas the *Swadlingbar* water did exhibit some minute cloud with the Alcalies:

Oil of Vitriol made an ebullition with it:

Syrup of Violets struck it of a deep green, Rhu-
barb

barb of an orange-colour, Ash-bark of a light blue, and Galls rendered it somewhat wheyish.

Scholium. The appearances in the three last paragraphs compared indicate an Alkali, and no calcareous Nitre.

The Analysis.

It carried some little Scum on its surface.

A gallon of the water exhaled to dryness gave of Sediment for the most part white, and a little yellow, thirty-six grains, which was of a strongly urinous taste, fermented strongly with Vinegar, turned instantly of a bright green with Syrup of Violets, excited a strong pungent smell, when rubbed with *Sal Ammoniac*, sparkled and stunk on the red hot iron; and lastly, being rubbed on Beef, laid by twenty-four hours and then boiled, reddened it, an effect common to this and the *residuum* of *Swadlingbar* water.

Corollaries. 1. *Lisbleak* first Spring, besides that it is at least as strongly saturated with Sulphur as the *Swadlingbar* water, and that also partly volatile, and partly fixed, is also, as well as that water, impregnated with an alkaline Nitre or *Natron*, which is more pure, or freer from other mixtures in this, than in that water.

2. As this water bears carriage, retaining its sulphureous quality entire at a distance, if carefully bottled and corked, it may be transported to *Dublin* or other places remote from the fountain for medicinal uses; and altho' we are only yet informed of its having been successfully used in the Itch and Scorbutic disorders both by drinking and bathing, in common with the *Swadlingbar* and other sulphureous waters; yet inasmuch as in all examinations by our senses, it possesses the same qualities as the *Swadlingbar* water, it is highly probable, that upon tryal, it would manifest the like operation and virtues.

S E C T. IV.

LISBLEAK second Spring.

THE second of these springs on the same lands of *Lisbleak*, lies about two hundred yards from the first, and southward from it up the Rivulet, but on the contrary side, this last being on the east side of the Rivulet, and within about two yards of it, and liable to be overflowed in wet weather. The soil about it is a little quaggy Curragh, with much black mud, and little water, and there is a large Turf-bog eastward from it, and about five or six perches from it, and westward, a low hill divided from it by the Rivulet.

The spring hath not yet been opened :

However, the water being examined at the spring head, *September 18, 1743.* being a fine dry season, the summer long protracted, and the springs as low as in the height of summer, appeared, by the taste and smell, and by the experiments on Silver, to be as strong as the water of the foregoing spring, being equally fetid, and tinging Silver as quick and as deep as that.

The Analysis.

1. *Natural.* This, in common with other sulphureous waters, when exposed to the air, precipitates a white matter in the course of its channel on the grass, &c. which it washes. The mud is glossy and shining, and of various colours, very different from common mud.

The water which had been taken up five days had certain black flakey substances, partly floating in it, and partly subsided, as is observed in the waters of *Swadlingbar*, and others of the sulphureous kind.

2. *Artificial.* This also exhaled to a dryness, by a mild heat, left a sediment of the same qualities as the foregoing

foregoing water, viz. it was of an urinous taste, and of a pungent urinous smell when rubbed with *Sal Ammoniac*; and the solution of it in distilled water continued clear with Oil of Tartar *per deliquium*.

Corol. *Lisbleak* second spring, as well as the first, very nearly resembles that of *Swadlingbar*, both with respect to the impregnating Sulphur and the alkaline Salt.

S E C T. V.

A third Spring in the Parish of KILLASHER.

THE well is about three feet over, and two feet deep: it was first taken notice of about the year 1741. The water is clear and carries no Scum, but in its discharge, colours the mud a little whitish. It is overflown in heavy rains.

It is situated about half a mile from *Derrycorry-bridge*; on the way from whence to *Belturbet*, a cross road turns off to the right hand, which leads to *Florence-Court*, and thence to *Sligo*. About a mile forward from the said cross-road on the way to *Florence-Court*, and about eighteen perches from the Road northward, in the side of the mearing between the Farms of *Drumlaghy* and *Tetynemona*, near the house of *William Crawford*, in a low valley, this well is to be seen.

That this belongs to the Class of the strongest of the sulphureous waters, appears from the following examination of it, made on the spot by my faithful Correspondent above mentioned, and by a specimen of it by him carefully bottled and corked in dry weather, and transmitted to *Dublin* in *October* 1743.

It was strongly fetid, even when it had been six weeks taken up.

A Silver six pence immersed in it half an hour at the fountain was tinged of a deep blue and copper-colour: and in the specimen transmitted to *Dublin*,
and

and examined six weeks after being taken up, it began in ten minutes to tinge a piece of Silver immersed in it of a copper-colour, which next morning was variegated with a copper, leaden and black colour; and the solution of Silver turned it of a dusky yellow, exhibiting withal a livid circle at the surface of the mixture, and a dusky yellow sediment: solution of Sugar of Lead gave much the same appearances as the solution of Silver; and solution of Copperas turned it black, and precipitated a black sediment; all evidences of a strong sulphureous impregnation.

The Sulphur also was further manifested by an incipient precipitation, or whiteness formed by dropping into it a little Oil of Vitriol, which exhibited a minute ebullition, and a white cloud next morning, as happens in the *Swadlingbar* water from the same Acid.

It lathered with Soap, altho' not without previous curds, and solution of Salt of Tartar exhibited a small white cloud, as did also Spirit of *Sal Ammoniac*.

Syrup of Violets exhibited a greenness in the upper part of the mixture, Galls rendered it a little wheyish, Logwood of a deep red, and Rhubarb of an orange-colour.

The Analysis.

A GALLON of this water exhaled, left thirty-eight grains of Sediment, which was of an urinous taste, and withal brackish and bitterish:

Rubbed with *Sal Ammoniac* it emitted a strong pungent smell: it presently turned green with Syrup of Violets, and fermented strongly with Vinegar: It gave a bright red to Beef, being rubbed, laid by, and then boiled with it: It sparkled and stunk on the red hot iron.

Corol. The third spring of *Killasber*, is strongly Sulphureous, equal, if not superior, to that of *Swadlingbar*, and withal, is also impregnated with an alca-

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line Nitre, but not without some small mixture of the ordinary calcareous Nitre and marine Salt, as seems also to be the case in the *Swadlingbar* water.

S E C T. VI.

Two Springs on the Land of MECHAN.

I SHALL consider these together, because they lye near each other, viz. on the land of *Mechan* (being part of the Glebe of *Killasber* in the same county of *Fermanagh*) which joyns a certain inland Lough, called *Lough Leean*, and part of *Lough Earn* on the North-side, as *Derrylogue* land joyns them on the South. I shall distinguish them by the letters, A. and B.

The Spring *A.* lies N. W. of *Lough Leean*, and about sixteen perches from it, being near that end of *Lough Leean*, which is farthest from *Lough Earn*.

B. the other Spring lies about seventy yards N. E. of *Lough Leean*.

These two springs are about a hundred and thirty yards asunder, and lye at the foot of a low fertile hill, which appears to be a clayey soil, but both springs are in a kind of a Mossy or Turf ground. They discharge themselves slowly Southward, and give a yellowish white colour to what they pass over. The spring *A.* being the Westermost, is wide and deep; *B.* is very shallow.

The following observations are the result of an examination made of them on the spot, and of specimens carefully bottled, and opened in *Dublin* above a fortnight after they had been taken up.

Bottles were filled with these waters, July 6, 1743. at four in the afternoon, the weather having been rainy most of the day, circumstances very disadvantageous with regard to the strength of the water, which however was considerably more fetid than *Swadlingbar* water,

water, both bottles when opened in *Dublin* as above, being very fetid, and having the flavour of a boiled egg, and the smell of the Well *B.* is such as to discover it self at a distance.

A Silver six pence immersed on the spot, half an hour in the water of *A.* became of a bright gold-colour, and a shilling immersed in the specimen transmitted to *Dublin*, became instantly of a golden colour on the edges, and next morning was copper-coloured on one side, and perfectly black on the other; and the water of *B.* tried in *Dublin*, exhibited the same appearances with Silver immersed in it in like manner.

The water of *A.* scalding hot, did not tinge Silver, but that of *B.* scalding hot, did tinge Silver, and its sediment smell'd somewhat Sulphureous, so that the Sulphur in *B.* seems to be more fixed than in *A.* and on the spot its feter seemed to be somewhat greater than in *A.*

The appearances of the waters of *A.* and *B.* tried severally with the three following solutions were the same in both, *viz.*

Solution of Silver exhibited a dark-brown cloud, and a bluish circle at the surface, and a brown grumous sediment.

Solution of Sugar of Lead gave much the same appearances with both as solution of Silver.

Solution of *English* Vitriol turned black with both, but on standing, the blackness vanished, and there remained a brownish sediment.

The water of *A.* lathered presently with Soap: that of *B.* also lathered, but not without previous curds: and accordingly *A.* was clear with solution of Salt of Tartar, but *B.* a little wheyish with the same solution.

Oil of Vitriol made a considerable ebullition both with *A.* and *B.*

Syrup of Violets struck a pale green with *B.* tho' not with *A.* Logwood gave a Scarlet with *A.* and

deeper than with *B.* Ash-bark a light blue circle with both.

The Analysis.

THE proportion of a gallon of the water *A.* exhaled, yielded of sediment about twenty-two grains: the same proportion of *B.* gave thirty-two grains. Both these sediments agreed in all experiments, being of a light brown colour, of a taste somewhat urinous, brackish and somewhat acrid: they struck presently a deep green with Syrup of Violets, made a great ebullition with Vinegar, excited a pungent smell rubbed with *Sal Ammoniac*; they sparkled and stunk on the red hot iron, and grew damp in the air.

Some of the same Sediment sprinkled into pipe water, and boiled with Cale rendered this of a much deeper green than the meer pipe water did, a well known effect of the native Alkali or Nitre of the Ancients; the Cale was also remarkably more flabby and tender, and alkaline Salts have the same effect. (*a*)

Corol. The waters on the land of *Mechan* are strongly Sulphureous, and more strong than the water of *Swadlingbar*, especially the water *B.* They also contain an alkaline Nitre, tho' not without a mixture of some neutral Salt, particularly *Sal marine*, and perhaps a little calcarious Nitre, especially the water *B.*

Such is the light afforded to us, by the artificial *Analysis* of this and other waters, by the heat of evaporation to dryness; but perhaps the natural *Analysis* will give us a more just idea of the real state of the minerals in these waters, particularly the Sulphur, which secedes to the surface, upon stagnation, unchanged by fire, which

(*a*) See an analogous effect of the Sediment of the Sulphureous water of *Drumajave* on Beef; and for the same reason, viz. on account of the quality of the impregnating Salt, the waters of *Aix la Chapelle*, are found to have the like effects on these and other Vegetables, viz. to give them a peculiar tenderness, and improve their greenness. See Dr. *Lucas's* Essays on waters.

which the artificial *Analysis* partly exhales, and partly confounds with other parts.

I shall therefore descend to a minute account of the nature and qualities of the *Scum*, which, in these slow-moving waters, is thrown up to their surface, particularly that of the spring *A.* and the rather, as this seems to consist of those more active, and less fixed, or more volatile parts, which give the principal activity to these waters, so that the account of this may serve as a specimen of the general nature and qualities of the minerals impregnating other waters of the same Class. For this account the public is indebted to the zeal, care, and accuracy of my worthy and faithful Correspondent, *James Leonard* above mentioned, in examining this *Scum* on the spot, and transmitting a specimen of it to *Dublin*, in order to be subjected to further trials, the result of which, was as follows.

The water of the Spring *A.* then was covered with a very strong *Scum*, which on the upper side was of a whitish yellow cream-colour, and when taken up, was found to be about an inch thick, and being turned, exhibited the following variety of colours. 1. A most beautiful deep grass green. 2. a pale, but beautiful gold colour. 3. A light reddish pink-colour, interspersed in a substance of a leaden, blackish colour, every colour excellent in its kind, and the whole as slippery as Frogs spawn. (a)

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A quart

(a) Varieties of colours in some measure resembling these, are also found in the preparation of *Lac Sulphuris*, variously exposed to the air: and if *Dr. Lucas* had been witness to this experiment, and been as accurate in examining the waters of his own country as those of *Spa* and *Aix la Chapelle*, I believe he would have been abundantly convinced that these waters owe their *Fetor* to something more than Stagnation and Putrefaction, and that as they in all properties, except Heat, agree to those of *Aix la Chapelle*, that they do also essentially, or even substantially contain a dissolved Sulphur.

He observes of the lower Springs of *Borset* (a hot sulphureous water) that they deposit a crust, which is also white, and partly-coloured,

A quart bottle was filled with this Scum, *August* 27. and arrived in *Dublin* *October* 12. where the following observations were made on it.

It was a slimy, variegated substance, black, red and yellow, of an excessively fetid smell, almost like that of a privy house, and when dried, it had something of a smell resembling that of sweaty toes, the Sulphur being exalted, and the Salt volatilized by putrefaction, as is also observable in the *residua* of some other waters, particularly in some of those, which, like this, are impregnated with *Natron*. (a)

The Scum dried, emitted a very suffocating fume on the red hot iron, and a white flame.

It gave an amber tincture to Alcohol, even the first day, which tincture by adding water to it, was precipitated in the form of a brown yellowish cloud.

It appears to be chiefly an inflammable substance, with but a very small admixture of other parts; for two ounces of it, in its slimy state, being put into a crucible on the fire, and loosely covered with a gally-pot, and kept there three quarters of an hour, left of grey ashes only six grains, and in the gally-pot was collected, not any *Flos Sulphuris*, but only a small quantity of a thin blackish substance, the rest being gone off in a white flame. The ashes had little taste, nor fermented with Vinegar, nor Oil of Vitriol, but were a little attracted by the Magnet.

Some pieces of Silver buried in this Scum, and laid by all night, were affected as by the water it self, *viz.* turned blue, yellow, and dark-brown.

The following experiment also concurs in shewing the sulphureous quality of this Scum, *viz.*

I boiled coloured, and gives undoubted evidences of Sulphur; and upon an accurate survey, and comparison of the hot and cold waters in different countries, it appears that these give as strong or stronger evidences of Sulphur than those.

(a) See the Book of waters impregnated with *Natron* in my larger work.

I boiled two ounces of it with three drams of Salt of Tartar, in a pint and half of water, to a pint, and then filtered the deep brown-coloured solution, to which Oil of Vitriol added, caused a great ebullition, and precipitated a gross substance of the colour of Ochre, which being washed from the adhering Salts and dried, flamed on the red hot iron with a white flame, and smell'd somewhat suffocating.

Corol. The fetid smell of this Scum, the suffocating fume it emits on burning, its various colours, as in the preparation of *Lac Sulphuris*, and the yellow precipitation from its solution with Salt of Tartar, by means of Oil of Vitriol shew Sulphur:

On the other hand, its slippery and slimey quality, and withal its burning not with a blue, but white flame, indicates rather Bitumen; so that it should seem to be a composition of Sulphur and Bitumen: and

Since the same composition does also probably obtain, in the Scum of our *Swadlingbar* water and most of this Class, may not the bituminous principle have a considerable share in improving the healing quality of these waters?

N B. It is probable that divers other parts of the world, have waters alike impregnated; for *Scheuchzer* in his *Iter Alpinum secundum*, mentions two waters, which he calls *Sulphureo-bituminous*, which, according to his account, appear nearly to agree to the water above described, particularly one in the Canton of *Zurick*, which is replete with viscid concretions (as is also the other spring by him mentioned) altho' pellucid like common spring water, and of a sulphureous smell, and used as a Bath in scabby diseases, and the walls of the Cistern containing it are incrustated with a *mu:ilaginoso* bituminous matter, of a greenish colour, and half an inch thick, which also swims in the water like Frogs spawn, which being inspissated, almost

to the form of an extract, emitted a fetid sulphureous smell, as it did also, when set on fire; and upon exhalation, it yielded but a small proportion of contents, viz. six grains of a subtile yellowish powder from thirteen pints.

S E C T. VII.

ASHWOOD Water

IS another of the same sort in the same county. It lies about twenty-two perches S. E. from the foot of a hill, called *Clunamuilick*, being a subdenomination of lands called the *Ash-wood* near *Gortagh's-Bridge*, which is about three miles west of *Enniskillen*. The spring rises in a bottom of a mossy or turfy kind of soil. The hill of *Clunamuilick*, is mostly a tough blue clay. It is part of the estate of *John Cole, Esq.*

The well discharges it self by a little stream of a slow motion, and continues the same in summer as in winter, running neither higher nor lower, and it never freezes. No beast will drink of it in the greatest extremity, as was proved in the late great frost.

Some of this water having been carefully bottled and corked in a dry season, *June 30, 1743.* was examined in *Dublin, July 23,* following, when it was fetid like the water of *Swadlingbar*, and had likewise the flavour of a boiled egg.

A Silver six pence immersed in the water on the spot, became in three quarters of an hour of a black, blue and copper colour; Silver money immersed in the the specimen above mentioned in *Dublin* five hours, became only a little yellow at the edges, and infused all night, was only a little of a muddy yellow next morning.

The solution of Silver mixed with the same specimen in *Dublin*, exhibited a small brown yellowish sediment,

diment, and solution of Sugar of Lead, an appearance much alike, but inclining to red :

The solution of Copperas turned it of a blackish clear, and exhibited a brown yellowish sediment.

It is a soft water, or in other terms, contains very little calcarious Nitre ; for Soap lathered soon with it, with only a little previous curdling, and the solution of Salt of Tartar was clear with it, and on standing, gave a scarcely sensible minute cloud and small white sediment.

Oil of Vitriol made a little ebullition with it.

It struck deeper tinctures with the following articles, than the sulphureous water from the bank of *Owen breun* (of which hereafter) did, agreeably to the nature of its Salt to be discovered by the *Analysis* : for Logwood gave it that deep blood red tincture called *Scarlet in grain*, Rhubarb an orange colour, Ash-bark a light blue, Syrup of Violets a light green, Galls little tincture, nor were the Corks blackened.

The Analysis.

1. *Natural.* This water gives a whitish colour to, and covers with a slippery kind of substance, such things as lye in its course. (a)

Some of the bottles had certain thin, almost pelucid substances floating in them, such as the waters of *Swadlingbar* and some others exhibit, being an assemblage of the sulphureo-bituminous parts.

2. *Artificial.* A gallon exhaled to a dryness, yielded twenty-eight grains of sediment, which was of a light brown yellowish colour, of a sharp, brackish and bitterish taste, and of an odd smell and flavour, somewhat sulphureous. It sparkled and stunk a little on the red hot iron. Rubbed with *Sal Ammoniac* it smell'd pungent. It turned presently of a deep green with

(a) See the observations on the Scum of the preceding water of *Mechan*.

with Syrup of Violets, and made a great ebullition with Vinegar.

Sixteen grains of it being boiled in six ounces of distilled water, to four ounces, and filtered, the solution was of a brown amber-colour, of an urinous and brackish taste. It left in the filtre only three grains of indissoluble matter, the rest exhaled to dryness, was a yellow Salt, which was of a strong, urinous and pungent taste, turned instantly of a bright green with Syrup of Violets, stunk and burnt black on the red hot iron, grew moist in the air, and being rubbed on Beef, laid by and boiled, rendered it of a deeper red, than Salt-petre would have done.

The indissoluble matter being calcined an hour became white, and mixed with the solution of Mercury, sublimate corrosive in water turned reddish, tho' it betrayed little of the taste of Lime.

Corol. *Asbwood* water is somewhat more weakly impregnated with Sulphur, than that of *Swallingbar*: an alkaline Nitre is common to them both, which in this water is more acrimonious than in that of *Swadlingbar*, to which, in all probability it agrees in Virtues, and is perhaps in some cases preferable.

S E C T. VIII.

DERRYHENCE or DERRYINCH Water.

IS the last of this Class in the county of *Fermanagh*, that I have had opportunity of examining.

It lies on the lands of *Derrybence* or *Derryinch*, on the side of *Lough-Earn*, within three yards south of its bank, and about five miles south of *Enniskillen*. The ground about it is one of the hardest and firmest kinds of Limestone, resembling Marble; the soil a blue Clay. The Spring is flooded over all the winter.

The spring as observed by my worthy Correspondent frequently above mentioned, *September 8, A. D.*

1746.

1746. was very full of certain wonderful water Insects, all of one form, about an inch long; they have a big hairy head, are bull-nosed, fenced with Hair, as it were instead of Horns, small-bodied; they joyn head to tail in ascending and descending, and extend themselves to full length, when at the top of the water, where they remain about two or three seconds of time, and then descend in a circle; some are always ascending, descending, and on the top, all in a perpetual active motion. This well seems their generation-bed, for no Insects like them have been observed any where else in these parts. (a)

A specimen of the water was bottled *July 10*, at seven in the morning, the weather rainy, and it was badly corked: notwithstanding which, when it arrived in *Dublin*, *July 23* following, it was very fetid, and Silver immersed in it three quarters of an hour, acquired a little of a golden tincture about the edges, and next morning it was of a brown yellowish colour.

Solution of Silver exhibited a yellowish cloud with it, and on standing, the mixture became of a light bluish colour near the surface, and afterwards gave a small brown sediment.

Solution of Sugar of Lead, gave a brown amber-coloured cloud, and a small whitish grumous sediment.

Solution of *English* Vitriol turned it of a dark clear, and of a light bluish on standing, but the blueness soon vanished, and there remained a small whitish sediment.

Soap curdled with it at first, but afterwards it lathered smooth; and so solution of Salt of Tartar was clear with it, but on standing, exhibited a whitish cloud and some small subsidence.

Oil of Vitriol made a small ebullition with it.

Syrup of Violets exhibited a light green in the upper part of the mixture.

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(a) *Short* observes something like this in another sulphureous water, which altho' it kills Insects thrown into it, has a peculiar sort of its own swimming in it, visible in Sun-shine.

The Analysis.

It has been observed to carry a blue Scum.

The proportion of a gallon of it, yielded twenty-one grains of Sediment, which was white and raggy, of a taste a little brackish and urinous, and a little hot under the tongue. It grew a little damp in the air, made a great ebullition with Vinegar, turned presently of a bright green with Syrup of Violets, and excited a pungent fetid smell, when rubbed with *Sal Ammoniac*.

Corol. Allowance being made for the badness of the season, when it was taken up, and its being badly corked, it appears to be a sulphureous water of considerable strength, both by the smell, and by the appearances with metals and their solutions. The Sulphur also is combined with an alkaline Salt, as in the preceding waters, together with a pittance of marine Salt, and perhaps calcarious Nitre.

S E C T. IX.

DRUMASNAVE or MOUNT-CAMPBEL Water;

WITHIN half a mile of *Mount-Campbel*, formerly called *Drumasnave*, a good market-town in the county of *Leitrim*, and within a mile of *James Town*, where is another good market once a week, and within four miles of *Carrick-Drumrusk*, or *Carrick* on *Shannon*, a third market-town, situated half a mile E. from the *Shannon*, in a delightful and plentiful country, where several hundred persons may enjoy proper accommodations during their use of the waters; thus situated, I say, is a certain spring, which for the great strength of its sulphureous impregnation, and the happy successes that have hitherto attended its use in the cure of divers stubborn diseases, demands our particular

cular attention, as being one of, if not absolutely, the strongest sulphureous waters in *Ireland*, and yields water enough to supply great numbers for both drinking and bathing.

It lies in a marshy ground by the side of a small lake, which in winter overflows it.

Dr. *Molloy*, a Physician in the neighbourhood examined this water on the spot, and made several observations of its effects on human bodies which I shall give in the sequel; and *July 19, A. D. 1743.* after rainy weather he filled several bottles of it, and sent them in a very hot season to *Dublin*, where they were examined *August 4.* following, and, notwithstanding the disadvantages of the weather and season, it abundantly manifested the strength of its sulphureous impregnation.

Upon the spot it was so fetid, that it was smell'd above sixty yards from the spring, even in a wet season: the water is as clear as crystal, tho' before rain it grows white: it is fetid, like the smell of the washings of a foul Gun, and it retained its strength very little diminished when examined in *Dublin* as above, being abominably fetid, and having a taste like rotten eggs, much stronger than either the water of *Swadlingbar*, or any of the above described sulphureous waters of the county of *Fermanagh*.

In the wet season in 1752. this water retained the sulphureous smell, and a flavour resembling that of a boiled egg, a month after it had been taken up.

Moreover, it was observable, that when it was evaporated, even to the consumption of half, it still retained the sulphureous flavour, and resembled that of a boiled egg, from whence we may with probability conclude, that this water might be applied to the purposes of warm bathing with much better advantage than *Swadlingbar*, and most of the foregoing waters, whose Sulphur is much sooner dissipated.

The

The next proof of the great degree of the sulphureous impregnation in this water is from its effects in discolouring the metals, and their solutions thus :

Silver immersed in it on the spot becomes in half a minute of a copper-colour, in ten minutes it is blackish, and in an hour, it becomes perfectly black ; in the specimen transmitted to *Dublin* above mentioned, Silver immersed, was turned instantly of the colour of gold, and in a quarter of an hour, of a deep copper-colour, and next morning it was black :

And when this water had stood on the fire all night, it still tinged Silver of a leaden-colour, shewing, that the Sulphur was in part only, and not entirely dissipated.

Gold immersed in the same specimen, became of a brighter yellow, and copper of a leaden-colour.

The solution of Silver exhibited a dark-brown grumous precipitation with the same specimen transmitted to *Dublin* as above, and so did the solution of Sugar of Lead, and the solution of Copperas grew black with it, and exhibited a black grumous sediment, all evidences of the strength and durability of the sulphureous impregnation, viz. in proportion to the darkness of the colours.

Next, the following experiments shew it has but few other contents, besides Sulphur, viz. the Hydrometre stood in it nearly at the same height as in distilled water, and Soap curdled with it at first, but soon lathered smooth ; and Oil of Tartar, and Spirit of *Sal Ammoniac* continued clear with it a good while, but on standing, it exhibited a small grumous sediment with the first, and a white cloud with the second, and with solution of Alum, a small white grume.

It made a considerable ebullition with Oil of *Vitriol* and Spirit of Salt, and some with Vinegar.

It struck a pale green colour with Syrup of Violets,

lets, (a) purplish first, and then deep red with Logwood, scarlet and almost crimson with Brazil, greenish with Sumach, wheyish with Galls, an orange-colour with Rhubarb, and a pale blue with Ash-bark.

The Analysis.

1. *Natural.* In the bottles transmitted to *Dublin* as above, were certain flakes or foliaceous substances floating, being an assemblage of the sulphureous parts, as in the water of *Swadlingbar*, and some others.

The stones, rushes, and grass, which are in the current, are perfectly white, from a tough slime of a strong sulphureous smell, (b) being truly a kind of magistery of Sulphur, or Sulphur precipitated by the air; for it emitted a suffocating fume, and two drams of it calcined in a Crucible emitted a flame, partly white, and partly blue (the peculiar character of Sulphur) and was on an hour's calcination reduced to a dram.

2. *Artificial.* A gallon of the water exhaled to a dryness, left half a dram of Sediment, which was brown with some white parts interspersed. It was fetid, of a brackish and nauseously bitter taste, with an urinous flavour. It presently turned green with Syrup of Violets, made an ebullition with Vinegar, smell'd pungent, and fetid, when rubbed with *Sal Ammoniac*, and sparkled and stunk on the red hot iron:

But in order to determine with greater accuracy the distinct nature of the constituent parts of this sediment, I boiled a scruple of it in twelve ounces of distilled water to six ounces and filtered. The filtered liquor was of a taste somewhat urinous and bitterish;
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(a) The experiments with Silver and its solution, with solution of Copperas, the Alcalies, and Acids, and Syrup of Violets were repeated with like success in another specimen of the water taken up in the wet summer. 1752.

(b) Compare the experiments on the Scum of *Machan* water.

it was also fetid, shewing with other experiments, that the Sulphur of this water is partly fixed: next, it exhibited no cloud with the solution of Salt of Tartar, an appearance agreeable to the homogeneous alkaline quality of this Salt: the remainder of the solution being indeed the greatest part of it, evaporated to dryness, left eight grains of Salt, of an urinous and very bitter taste; it turned green presently with Syrup of Violets, fermented with Vinegar, excited a pungent, urinous smell when rubbed with *Sal Ammoniac*; it melted on the red hot iron, and stunk there like burnt rags, and likewise rose in small blisters, as the *Nitrum calcarium*, indicating with the foregoing experiments a composition of the native alkaline Nitre, and the calcareous Nitre, such as obtains in the sulphureous water of *Derrylester* described above, and in the *Clifton* water described in the Book of Waters impregnated with *Natron* in my general History. Moreover, the same Salt turned milky with the solution of Mercury sublimated corrosive in water, as the volatile Alkalies: It grew damp in the air; and lastly, Beef being rubbed with it and laid by, turned of a dark red colour, and the success was the same with the *residuum* of this water rubbed on Beef, (tho' the water it self had not this effect;) and it was observable, that the Beef became remarkably tender, (a) an effect common to the native as well as to the artificial Alkalies, as is also the reddening of Beef.

The indissoluble matter separated from the saline and left in the filtre weighed eight grains, and so is equal in quantity to the Salt: it sparkled greatly and stunk on the red hot iron: it fermented with Spirit of Salt, tho' not with Vinegar, and turned of a bright green with Syrup of Violets. Calcined two hours, it acquired very little of the taste of Lime, yet turned

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(a) See an analogous effect of the sediment of the *Mochan* water in greening Cale, and rendering it also more tender.

ed of a deep red with the solution of Mercury sublimate corrosive in water.

Corol. The water of *Drumafnave* is strongly Sulphureous, considerably more strong than any of the preceding waters, and it gives a clearer indication of Sulphur than most of them, viz. by the blue flame emitted by its white sludge in burning, and this Sulphur is partly volatile, and partly fixed, and more fixed than that of the preceding waters. Its predominant Salt is an alkaline Nitre, joyned to an absorbent Earth, and a little calcarious Nitre (a)

From these principles, it is obvious to conclude, that this water must be antacid, or a sweetener of Acidities, detergent, saponaceous, aperient, attenuating and balsamic; that it bears carriage well to remote places, and better than most of the foregoing sulphureous waters, and wherever a stronger sulphureous water is proper, claims the preference; and altho' it has not been so much used as the *Swadlingbar* water, nor as it deserves, the following histories of its good effects in similar and other cases will recommend it to the further observation of physicians.

It is very Diuretic, and Dr. *Molloy* observes it ordinarily to make the drinkers very costive, tho' it purges some: that it gives spirits and a good appetite, but that it emaciates the body surprizingly, attenuates and fuses the humours greatly, from whence he concludes, that it must be improper in the *Tubes*, and in all Colliquations, and he affirms, that he knew one who had thrown himself into imminent danger of a Consumption by the use of this water. He also observes, that when it did not pass off by urine, it sometimes gave

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pain

(a) The second *Caroline* Bath in *Germany* called *Fons molaris*, has a Salt alike compounded, viz. partly urinous, and partly bitter, but in greater proportion than in this water, whence it is constantly purgative, which ours is not, or in a less degree, having too small a proportion of saline contents, tho' it also frequently opens the belly.

pain in the Belly, *Tenesmus* and strangury, and in one a mortal tympany ensued: such effects indeed are also common to other mineral waters taken without due preparation, and a proper regimen under the direction of a physician, tho' these waters in particular, being more strongly saturated with Sulphur, may require a less dose than the lighter ones of *Swadlingbar* and others.

In curing cutaneous disorders, it frequently increases the eruptions on the Skin previous to its healing them, in common with *Swadlingbar*, and several other mineral waters.

Among others who drank this water, *James Armstrong* of *Anoduff*, took a quart every morning for a week, and shewed Dr. *Molloy* his watch, who assured me, that it was as black as if he had been rubbed all that time with Brimstone, a fact (if confirmed by other trials) of importance, shewing the great penetrability of the Sulphur in this water, and that it retains its native properties, even after it has passed thro' the pores of the Skin.

I shall next relate a few cases, wherein the good effects of this water have been experienced, similar in a great measure to those of *Swadlingbar*, and other sulphureous waters.

A certain person had been troubled with an obstinate Heartburn, discharging mouthfuls of an acid liquor after all kinds of food. He had taken absorbents, alkaline salts, vomits, and bitters, all to no purpose: on drinking these waters six weeks, he was entirely cured; and moreover, another effect of them was also remarkable in him, viz. that, whereas he had from his infancy been troubled with Scales in the palms of his hands, which used to fall off three or four times in the year, and then return again in the space of a month, his hands continued clear for many months after his drinking these waters.

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The next instance, communicated also by the physician above mentioned, *February* 1744. was of its good effects in the Gravel, as a very powerful diuretic, if not in some degree lithontriptic, *viz.*

One who had taken *Stephens's* medicines several months for the stone, and discharged with pain, prodigious quantities of Scales of stones, with an incredible quantity of slime, until he was free from all symptoms of Stone or Gravel for six months; however, being desirous of a further establishment of his cure, he, the beginning of last summer, living four miles from the well, rode thither daily, and drank the waters for three months: he had not drank them a fortnight, until he began to discharge scales of stones as he had done before, during his use of *Stephens's* medicines, and withal a large quantity of small Gravel, but which came from him without pain, and these discharges continued more or less for a month: he has been free from all complaints ever since, and his urine is returned to its natural state.

The following History is a remarkable example of its good effects in Pains and Contractions of the joynts, agreeable to the virtues attributed to the sulphureous waters in general, *viz.*

A woman formerly famous for having been a good spinner, had for some years past been troubled with such a contraction in the fingers of both hands, that they were almost rigid and immoveable, and sometimes attended with pain, and she had frequent touches of Rheumatic pains in several parts of her body, particularly in her arms. She drank these waters to the quantity of three quarts in a day for the space of six weeks, whereupon her pains left her, and she could use her hands and fingers as well as ever.

I am moreover informed that several Dropsies, and obstructions in the Hypochondres, with the Jaundice, have been cured by the use of these waters, virtues attributed to the sulphureous waters in general, as well as

to the simple Chalybeates, and supported by undoubted facts.

And the following history is a memorable instance of the powerful attenuating and deobstruent quality of these waters, *viz.*

A woman was troubled with what is vulgarly called a *Cake*, or scirrhus tumor in the left side of her belly. It was of the breadth of an ordinary pewter plate, very hard and prominent. The weight of this tumor was very great, and it gave her much uneasiness, particularly in bed: she had no apparent swellings in her legs, or elsewhere, but was greatly emaciated by it.

She drank this water to the quantity of about three quarts in a day, for the space of three weeks, whereupon the tumor gradually wasted, and her belly became as soft and supple on the grieved side, as on the other, and all her complaints vanished.

I am not indeed informed of what the sensible operation of these waters was in this case; this account however, imperfect as it is, might challenge the whole tribe of pharmaceutical remedies for a cure of such a tumor so effectual and expeditious.

Of their good effects in healing Ulcers, both by external and internal use, I met with several instances agreeable to those of the *Swadlingbar*, and other sulphureous waters in the like cases, as also in cutaneous diseases, even of the most rebellious kinds, some of which I shall describe, in order to shew, that waters similarly impregnated, have similar virtues, and may, upon occasion, be substituted one for another: but it may not be unnecessary to remark, that in order for the eradication of divers of these stubborn disorders, it becomes frequently necessary to repeat the use of the waters, for several seasons successively.

That it effectually cures the common Itch, and besides red pimply Faces, a man whose Skin was covered over with white Scales, was in a great measure cured by

by only one month's use of the water, I am well assured ;

But the following cases fell under my own inspection.

1. *A. D.* 1748. A young man aged twenty-five, had for seven years been troubled with a cutaneous disorder, resembling in some sort, an inveterate Itch, being attended with itching and a watry humour, particularly on the thighs and breast, which dried off in white scales. It was always worst in cold weather, tho' it was exasperated by violent exercise, hard drinking, and the heat of the bed, and he was relieved by bleeding, purging, and a low diet. He had also pains in his limbs, and was subject to languors.

I ordered him first an artificial sulphureous water, afterwards salivated him, and next sent him to one of our Chalybeate waters, from each of which several courses he was relieved, but always relapsed ; and in *May* 1751. being very cold weather, the usual pustules, returned in as bad a state as ever : I therefore dismissed him in *June* to these waters, of which he drank five pints in a day for the space of six weeks, which purged him in the beginning. He returned to *Dublin* the latter end of *July* with a clear Skin, and the watry humour at the breast, which used to be the most lasting, was entirely dried up. He repeated the use of the waters in *August* 1752. and continued free from any, except slight returns of his disorder to *May* 1753. and was perfectly well *February* 1754.

2. A young man troubled with an inveterate disorder tending to a Leprosy, with a white Scurf on the palms of his hands, and tetters appearances scattered here and there over his body, was sent to this water in *September* 1743.

He was a little vertiginous on drinking it at first. He drank about three quarts in a day, and bathed his whole body in the water made hot three times in a week, for the space of six weeks. He took Sena and

Prunes once in a week during the use of the water, which [water] operated chiefly by urine, and the latter part of the time, kept his belly soluble, gave him a good appetite and alacrity; nor did it chill him tho' used at this time of the year, (a circumstance unfavourable to his cure) however *November* 10. he returned to *Dublin* much better in his hands, but withal had a greater appearance of the white scurfy eruptions, even on such parts of his body where he had them not before.

His disorder continued in a milder way thro' the next winter and spring, and next summer he went again to the same waters, and continued their use, by drinking and bathing most part of the season, and took them in nearly the same dose as before, which for a while, threw out the scurf in greater abundance, and raised a great heat and itching in the palms of his hands, but at length, his Skin became clearer, tho' the waters did not pass well thro' his bowels this second time of using them, probably for want of a proper regimen, which had he observed under proper directions, and continued the use of the waters long enough, it is highly probable his cure would have been compleated.

3. A gentleman aged thirty-five, hereditarily scorbutic, had for two years a white scaly Scurf almost covering the palm of one hand, without any considerable itching.

In *July* 1751. being a very wet season, he began the use of these waters, and drank at the fountain three pints in a day for three weeks, premising, and sometimes interposing a purge of *Glauber's* Salt, whereupon the white Scurf vanished.

It is true, he had some return of his disorder in *September* following by an appearance of a roughness, fissures and heat of the same part. He was advised to repeat the use of the same waters, with a prospect of greater advantage in a better season.

4. A boy aged fourteen, having before been subject to pains of the belly, became free from them after the appearance of a Tetter, succeeded by pustules resembling an inveterate Itch. He took four pints of this water in a day for the space of a month premising and interposing every tenth day a lenitive Cathartic. Hereupon the eruptions vanished, yet not so far but they returned, and he was obliged to repeat the waters again another season, which was done with good effect, as likewise often happens in other similar stubborn cases of the same sort (a).

5. A man above fifty, long Hypochondriacal and Scorbutic, was relieved of both complaints by drinking three pints in a day of this water, which raised a breathing sweat, and proved somewhat laxative.

S E C T. X.

ANADUFF Water.

AT *Taasb* in the parish of *Anaduff*, about a small mile distant from the foregoing water of *Drumafnave*, are three mineral Springs, two of them Chalybeate, and one Sulphureous, lying in a small hollow between two beautiful rising grounds: the last mentioned, lies about forty yards from the lower of the two Chalybeate springs, and is a little less loaded with Sulphur than the water of *Drumafnave*.

Four bottles of it filled in dry weather, *October 2, 1743.* arrived in *Dublin* the eleventh of the same month, when it was clear, but bluish when viewed from above, of a somewhat fetid smell, like *Lac Sulphuris*, with the flavour of boiled eggs: when it had been exposed all

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night,

(a) In such cases, it might be proper to try cold bathing, and especially in Sea water as deterging the cutaneous glands by the saline stimulus, and discussing the humors that obstruct them, and being found by experience to be the most effectual method of securing from a relapse, according to the Observation of *Dr. Speed* in his *Commentarius de Aqua marina*.

night, it lost the fetid smell, and so it is one of those waters, whose Sulphur is soon dissipated, tho' neither is it of the weakest kind; for Silver immersed six hours in the above specimen examined in *Dublin*, turned of a copper colour, and brown, and the solution of Silver exhibited a yellow cloud, and a livid circle at the surface of the mixture, and on standing, a brown sediment: solution of Sugar of Lead, exhibited much the same appearances: solution of Copperas, gave a dun blackish colour, fading to a blue.

Besides Sulphur, it does not appear to be much saturated with other matter; for the Hydrometre stood at the same heighth in this, as in distilled water; however, it curdles with Soap, and precipitates a small white cloud with solution of Salt of Tartar, and with Lime-water, it exhibited a whiteness, and with solution of Alum, a gross white, grumous sediment, and Oil of Vitriol excited a considerable ebullition with it, and Vinegar some; all evidences of a terrestrial absorbent matter, as will be confirmed in the *Analysis*.

Next, the experiments with the tincturing articles, shew a weakly impregnating Alkali, *viz.* Syrup of Violets gave it a pale green, Logwood a pale purple, succeeded by a deep red, Brazil a cherry-colour, Rhubarb an orange, Ash-bark a pale blue, on viewing the mixture sideways; Galls turned it wheyish, and gave a pale blue circle at the surface of the mixture.

The Analysis.

THE proportion of a gallon yielded at a *medium*, twenty-seven grains of sediment, which was of a brackish and urinous taste, turned instantly green with Syrup of Violets, fermented with Vinegar, rubbed with *Sal Ammoniac*, emitted a pungent, urinous smell, and on the red hot iron sparkled a little, and stunk with a suffocating fume.

The Salt separated from the indissoluble matter was in weight nearly equal to the last, of a yellow colour,
of

of an urinous taste, moistened a little in the air, lay still on the red hot iron, save, that it sparkled there, and burn'd to a black cinder. Beef on which it had been rubbed, and then boiled with it, was reddened in some few spots: with *Sal Ammoniac*, Syrup of Violets and Vinegar, it excited the same several appearances, as the sediment in the preceding paragraph did.

The indissoluble matter, calcined three hours, shew'd it self to be Lime-stone, or a calcarious Earth by the taste it imparted to hot water poured on it, and by the reddish colour it gave to the solution of Mercury sublimate corrosive in water.

Corol. *Anaduff* water is of the Sulphureous kind, of an intermediate degree of strength between the strongest and weakest of that Class. Its predominant Salt is an alkaline Nitre with a mixture of one of the *Salia media*, and about an equal weight of calcarious Earth.

It is probable that such weaker waters are preferable as such, to the stronger in some cases: we however know but little by observation and experience of the operation and virtues of this water.

It was observed that cattle drinking greedily of this instead of other water, in the time of the hard Frost, were greatly purged by it; but this effect was probably only accidental, and from the novelty of the drink, (as the like happens also to mankind frequently on their first use of the weaker Sulphureous, and even of some of the plain Chalybeate waters) since it yields so small a proportion of Salts, as above mentioned.

It is probably a good Anthelminthic, even as other waters of this Class. Dr. *Molloy* found that a handful of Earth-worms just taken out of the ground and thrown into this water, were deprived of all appearances of life in less than a minute's time, and had lost their red colour, and were become whitish as if macerated in warm water; and he was informed, that this water had the same effect in killing other small

small Fishes, and even Frogs; experiments encouraging the drinking of it for destroying Worms in the human body, Authors who have searched for Anthelminticks by experiments on Earth-worms, having found no liquor which may be safely taken into the body, in which they will not live some little time, Oil not excepted.

S E C T. XI.

AGHALOO Water

ON the land of *Cavan O'Neal*, about one mile N.W. from *Aughnacloy*, and three miles and an half from *Augher*, in the parish of *Aghaloo*, barony of *Clogher*, and county of *Tyrone*, is a water of a very strong Sulphureous smell, not only at the fountain, but when conveyed to remote places, as to *Dublin*, where it retained the smell strongly, together with a flavour like that of a boiled egg, after it had been taken up above a fortnight, tho' in a bottle of it kept fourteen months, the smell was lost.

It is situated in a Limestone ground, and at the bottom of the well, is a Limestone rock.

It certainly belongs to the stronger Class of the Sulphureous waters; for at the fountain it tinged Silver deeply black in four minutes, and of a copper-colour in less than half a minute; and it was observable, that it tinged the Silver visibly deeper after it had been taken out of the well, than in the well itself, a fact analogous to what is elsewhere observed of the Chalybeate waters with respect to their tinging with Galls, and imputed to the ferruginous particles running into larger combinations upon standing, before they precipitate their Ochre; but to return, the specimen transmitted to *Dublin* as above, tinged one piece of Silver of a copper-colour, and another of a deep black in a few minutes, which is a greater effect than

than *Swadlingbar* water has: and with solution of Silver it precipitated a dark brown grumous sediment.

Besides Sulphur, it is not impregnated with any large proportion of other matter: in a small phial indeed equally filled with this and common water, the first appeared to be five grains heavier than the last, but it soon lathered with Soap after a little curdling, and the depurated solution of Pot-ashes exhibited only an extremely subtil white cloud with it.

Galls infused in it rendred it first wheyish, then yellowish, and in two or three days exhibited a green circle at the surface, and the Galls at the bottom became of a purple-colour. This last appearance seems to indicate some pittance of iron, which will be partly confirmed by the *Analysis* hereafter, altho' the water at the fountain, did not give any tincture with Galls, but only a wheyish colour.

The Analysis.

The mud at the bottom of the well is black, and a little slippery.

The water in exhaling soon left a whiteness on the sides of the pan, and yielded a little Scum, and a gallon of it left in one experiment thirty-two, in another thirty-five grains of sediment, which was of a white and brownish colour, and in one experiment, had a blush of red, and was in some small parts of it attracted by the Magnet. It was of a brackish, urinous and nauseously bitter taste. Rubbed with Syrup of Violets it turned presently of a deep green, with *Sal Ammoniac* it emitted a pungent, urinous smell, with Salt of Tartar a pungent smell, with a fixed Salt made of Tartar and Nitre, it excited a smell strongly Sulphureous, and more pungent than with Salt of Tartar alone. These appearances shew *Natron*, and withal are an indication of a fixed Sulphur. It moistened a little in the air. On the red hot iron it smell'd like burnt horn or leather.

Corol.

Corol. Agbaloo water is strongly Sulphureous, stronger than that of *Swadlingbar*, and bears carriage to remote places. Its Salt is an alkaline Nitre mixed with a little of the *Sal catharticum amarum*, or common calcareous Nitre, as in the second *Caroline* Bath in *Germany* called *Fons molaris*, and in *Clifton* water, and in our *Derrylester* and *Drumasnave* waters. Moreover, from the purple-colour acquired by the Galls in the above experiment, together with the blush of red in the *residuum*, and its being slightly attracted by the Magnet, I suspect also a pittance of Iron, tho' not in quantity considerable enough to entitle it to the denomination of a Sulphureo Chalybeate water.

As to the operation and virtues of this water, we do not know much by observation; however from the preceding *Analysis*, and the following casual tryals, it seems not rash to infer, that it is possessed of the like virtues as the other waters of this Class.

It scarcely purges unless taken in a very large quantity. It has proved effectual in the cure of sore Eyes of the worst kind: an inveterate Ulcer was healed by it; and the following case was communicated by *Robert Miller* Apothecary at *Augher*, A. D. 1749.

"A young gentlewoman now twenty years old has been from her infancy, to my knowledge, affected with scorbutic Ulcers all over her feet and legs, which (tho' several methods, such as salivations, diet-drinks, and frequent purges were tried) never abated until she began the use of this water, which she drank, and bathed her limbs constantly in the same, and I know she is now perfectly well without any other assistance."

I shall conclude this first Class of the Sulphureo Nitrous waters with this general observation, *viz.* that these waters are eminently soft, balsamic, healing and sweeteners of acidity, being impregnated with a Sulphureo bituminous matter, joyned to a native alkaline Salt; they are diametrically opposite to the Vitriolic waters, the histories of which I have given above,
these

these last being impregnated with an acid in some degree corrosive, and so far less safe in internal use: and altho' there are not wanting instances of the good effects even of these last in divers obstinate cutaneous cases, it is undoubtedly most eligible to begin with these mild Sulphureous waters, the sharp Vitriolic requiring much more care, and circumspection in their use.

CLASS II.

SULPHUREO NITROUS Waters.

I proceed now to the second Class of the Sulphureo Nitrous waters, that is to say, of waters impregnated with Sulphur, and the ordinary calcareous Nitre, or native bitter purging Salt (a Salt entirely different from the alkaline Nitre in the foregoing Class, altho' too often confounded with it) a combination far less frequent than that of Sulphur with the native Alkali or *Natron*, and accordingly, I have as yet found but few of these either here or abroad according to the accounts given us by foreigners.

SECT. I.

DERRINDAFF Water.

THE first spring of this sort I shall take notice of is found on the lands of *Derrindaff* belonging to *John Enery of Bawnboy, Esq;* on the bank of *Owen more*, or the great river, which is said to be the head of the *Shannon*, in the parish of *Templeport*, and barony of *Tullabew*, and county of *Cavan*, westward from *Culkagh* mountain, in a large tract of country called *Glengaulier*, lying between *Culkagh* and another great mountain called *Sleave an Yiarin*, i. e. the *Iron mountain*, and about five miles southward from the pound
Largy,

Largy, which is on the great road leading from *Belcoo* to *Sligo*, in a mountainous country.

The well lies within an inclosure among long grass, rushes, &c. It is deep and pretty wide, and contains a great deal of water, and discharges it self by a flow stream into the river, which is within six or seven feet of it.

This water examined by my faithful Correspondent above mentioned, in a dry season, *August 28, 1743.* betrayed it self by the fetid smell before he saw it; and he observed on drinking it, that it left a kind of roughness in the mouth like weak Alum-water, which was also observable on agitating it in the mouth in a specimen of it transmitted to *Dublin*, and examined there six weeks after its being taken up, which was very clear, and smell'd fetid like *Lac Sulphuris*, and had the flavour of a boiled egg, or of *Sal polychrest*, with the nauseous bitter taste.

The following experiments shew the great strength of the sulphureous impregnation, *viz.*

A Silver six pence immersed in the water at the fountain changed its colour in less than two minutes, and in eight minutes became of a deep copper-colour; and in the specimen transmitted to *Dublin* as above, Silver turned almost black in a few minutes, and next morning was of a deep copper-colour on one side, and black on the other; and the solution of Silver exhibited a dark yellowish grume and cloud, and then a dark-brown sediment; and solution of Sugar of Lead gave much the same appearances as solution of Silver: But solution of Copperas presently turned this water (*viz.* six weeks after it had been taken up) black, and precipitated a black sediment.

Copper immersed all night in the same specimen of the same water was covered as it were with black dust, and Gold became of a deeper yellow.

Besides Sulphur, it is but sparingly impregnated with other principles, for the Hydrometre stood in it
at

at the same height as in distilled water equally exposed; it curdled a little with Soap; Solution of Salt of Tartar gave some exceedingly subtile white cloud with it; Spirit of *Sal Ammoniac* scarce any; yet solution of Alum gave a white cloud and a white grumous sediment, and Lime-water an incrustation on the sides of the glass; Oil of Vitriol made but very little ebullition with it, Spirit of Salt none at all: Beef was not reddened by being infused and boiled in this water; nor was an equal quantity of milk boiled with it curdled.

It did not strike purple with Galls, but turned wheyish, with a slight blue circle at the surface of the mixture. Logwood gave it slowly a deep red; Brazil a pale scarlet, Rhubarb an orange-colour, Ash-bark a pale blue circle viewed sideways, and Syrup of Violets a pale green colour in the upper part of the glass.

The weakness of these tinctures, and the rest of the experiments above shew no Alcaline Salt, and but a very small proportion of either calcarious Nitre or Earth.

The Analysis.

The surface of the water is of a dull waterish azure, or whey-coloured blue.

A gallon exhaled to a dryness left twenty-three grains of grey sediment, which stunk, and had a sulphureous flavour: it was of a nauseous bitter taste, grew damp in the air, fermented with Vinegar, soon turned of a bright green with Syrup of Violets, but did not excite any pungent smell when rubbed with *Sal Ammoniac*. It sparkled on the red hot iron.

The Salt separated from the indissoluble parts dried in the pan stunk a little: it was of a bitterish taste, and grew moist like a paste in the air, and a solution of it in distilled water exhibited a white cloud with solution of Salt of Tartar.

The

The indissoluble matter dried, flamed on the red hot iron, tho' not with a blue, but white flame, and it stunk.

Corol. *Derrindaff* water is strongly impregnated with Sulphur, partly volatile, and partly fixed, and bears carriage well. Its predominant Salt resembles *Sal polychrest* with probably a little marine Salt; and altho' we are not acquainted with its virtues from observation, yet from the strength of the sulphureous impregnation, we may infer, that it is possessed of the like virtues as other sulphureous waters, and probably greater than several of them.

S E C T. II.

The Spring near OWEN BREUN.

THIS spring is situated at the distance of scarcely a perch from the bank of a small river called in *Irish*, *Owen breun*, or the *stinking-river*, and about twenty perches up the stream from the stone quarry belonging to *John Cole*, Esq;

That part of this river which is near the spring, is about three miles and a half W. S. W. from the mountain *Bin aughlin*, about midway between the *Bin* and the great mountain *Culkagh*, and ten miles more or less from *Enniskillen*. It is surrounded by mountains on every side. Here are three springs in the time of great floods liable to be overflowed by the river, from the inundation of which, even in the time of the highest flood, it seems however very possible to defend it by the labour of two men in less than a day; and if this were done, it would probably be one of the strongest sulphureous springs in or near this country.

The river seems to differ in nothing from other mountain-rivers, being of a darkish colour like bog-water, and not discolouring Silver immersed in it, and
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so seems to have derived its name from its being sometimes contaminated by the Sulphur of these springs.

The strength of the sulphureous impregnation appears from the following observations :

Its smell was perceived at the distance of two perches from the well. A specimen of it bottled *July 6, 1743*, and examined in *Dublin, July 26* following, retained the fetid smell, and had the flavour of boiled eggs.

A Silver six pence infused in the water at the fountain for half an hour acquired a copper-colour, and was blackish withal. A shilling immersed all night in the above mentioned specimen transmitted to *Dublin*, became first of a Gold-colour at the edges, and next morning copper-coloured and black all over, effects equal to what the same water had at the fountain-head : nevertheless, it does not bear much heat without dissipation of the Sulphur, for when made scalding-hot, it did not tinge Silver.

Solution of Silver with the same specimen exhibited a brown cloud, and a brown, yellowish grumous sediment.

Solution of Sugar of Lead gave much the same appearances as solution of Silver : and

The solution of Copperas turned it black, but on standing the blackness vanished, and there appeared a brownish sediment.

The following experiments with Alcalies, with Oil of Vitriol, and with the tincturing articles, shew a Salt different from the native Alkali, and combined with an absorbent Earth, *viz.*

This water produced a considerable coagulation with Soap, and yielded a white cloud, and a white grumous sediment with solution of Salt of Tartar.

Oil of Vitriol caused an ebullition of some considerable continuance with it :

Syrup of Violets exhibited no greenness, Logwood gave a red colour, Rhubarb a brown amber, Ash-bark a

light blue, and Galls a bluish circle at the surface of the mixture.

The Analysis.

It is a clear water, but covered with a dark copper-coloured Scum.

This water, when made scalding hot, tasted somewhat like *Hepar Sulphuris*, and when evaporated low down, it was nauseously bitter.

A gallon exhaled to a dryness, yielded forty-three grains of sediment, partly brown, and partly white, of a brackish and bitter taste. It soon turned green with Syrup of Violets, and made an ebullition with Vinegar, tho' far less than the sediments of several of the waters impregnated with *Natron* did. It also excited some little urinous, pungent smell when rubbed with *Sal Ammoniac*, but far less likewise than the sediments of those other waters did.

This sediment boiled in eight ounces of distilled water to fix, and filtered, yielded ten grains of pure Salt to seven of indissoluble matter.

The clear solution had the nauseous bitter taste proper to calcarious Nitre, and whitened with solution of Salt of Tartar. The Salt in substance had the same taste, and being rubbed with *Sal Ammoniac*, excited a little of a pungent and fetid smell, fermented with Vinegar, and presently turned green with Syrup of Violets: Milk boiled in the proportion of half a pint to half a dram of the Salt was curdled: The same Salt melted in blisters on the red hot iron like Alum, even as the calcarious Nitre does.

The indissoluble matter betrayed but little of the taste of Lime upon calcination; yet as it turned reddish with the solution of Mercury sublimata corrosive in water, and the water it self ferments with Oil of Vitriol, we may conclude it is partly a calcarious or absorbent Earth.

Corol.

Corol. The spring near *Owen breun*, is strongly impregnated with Sulphur, partly volatile, and partly fixed, (the water bearing carriage) which is combined with calcarious Nitre mixed with a little *Natron*, and oborbent Earth.

We know nothing of the Operation and Virtues of this and the foregoing water by experience, and therefore must have recourse to Analogy, from whence it is highly probable, that they are possessed of the like Virtues as other sulphureous waters, and of whatever can be the result of a combination of the calcarious Nitre with the Sulphur in so small a proportion as not to give them a properly cathartic operation, but render them rather diuretic and alterative, attenuating and cooling; that they are indeed less adapted to correct Acidities than the sulphureous waters of the first Class, whose Salt is urinous and alkaline, but at the same time have this advantage of those, that these may be prescribed with less caution, where the Humors tend to a putrid and alkaline state.

S E C T. III.

P E T T I G O E Water

PE T T I G O E is situated in the county of *Donnegall*, three miles S. from *Lough Dirgh*, or *St. Patrick's Purgatory*, and twelve miles E. from *Ballyshannon*. The spring is in the county of *Fermanagh* and barony of *Lurge*, on the lands of *Leavry*, a mile S. E. from *Pettigoe Church*, near the bank of the river *Termon*, and in the neighbourhood is plenty of Limestone, agreeable to *Shori's* observation of several of the sulphureous waters coming from Limestone rocks.

I examined this water in *December 1742*. in a dry season, when, of all the sulphureous waters that had come under my notice, this appeared to be the strongest, being of an excessively fetid and nauseous smell

and flavour, resembling a mixture of Brimstone and rotten eggs, and so is of a much higher flavour than *Swadlingbar*, and moreover it retained this *fetor* when brought to *Dublin*, (a distance of ninety-two miles) eight days after it had been bottled, so that this water bears carriage to remote places without considerable loss of its original qualities.

The experiments made by the immersion of metals, and the admixture of their solutions, abundantly confirmed the great strength of the sulphureous impregnations, *viz.*

A Silver six pence immersed in the water at the fountain, and brought to *Dublin*, was of a dark colour almost black, bluish and copper-coloured; and as the water at this distance retained its smell, so it had very nearly as great an effect in discolouring Silver as at the fountain; for Silver on a quarter of an hour's immersion here, was darkened all over, and in twenty-four hours was of a deep, fusc and copper-colour, and the colour of Gold was advanced to a reddish: but it is necessary to keep the bottle well corked, else it soon loses its sulphureous quality; for when it had been purposely exposed in a glass twenty-four hours, it had lost its smell, turned wheyish, nor did it any longer tinge Silver.

A few drops of solution of Silver added to an ounce of what was brought to *Dublin*, as above, and poured out of a bottle that had been opened the day before, but corked again after a glass or two had been taken out of it, turned it of a muddy deep amber-colour, with a livid circle at the surface, and precipitated a dark brown grumous sediment, and solution of Sugar of Lead had much the same effect: but solution of Copperas exhibited a dun, and then a black colour; and a black sediment, (a sure evidence of the strength of the Sulphur, especially in a water so disadvantageously circumstanced as above;) and a pewter vessel, into which it was poured, was soon blackened by it.

It

It is a light water, the Hydrometre standing in it at the same height as in distilled water equally exposed :

It is however a hard water, curdling greatly with Soap, and exhibiting a white cloud, and large white sediment with Oil of Tartar, tho' it does not curdle Milk.

It made an ebullition with Oil of Vitriol.

It did not blacken its cork, nor did Galls exhibit any purple colour with it, but a turbid wheyishness.

It struck a pale green with Syrup of Violets, a purple with Logwood, and a brown amber tincture with Rhubarb.

The Analysis.

1. *Natural.* It is common to this with most of the sulphureous waters, to exhibit a white or cream-coloured scurf or sediment on the stones in its Channel, and the blades of grass it washed, were of a copper-colour : It also exhibited in the bottles in which it had been kept, certain dark coloured flakey substances like thin leaves, which had subsided to the bottom, an appearance common to other sulphureous waters.

2. *Artificial.* In exhaling, as usual, by a mild heat in a glazed pan, the sulphureous smell abated very much, but it retained something of the flavour of that mineral, even until it was evaporated to dryness, when from a gallon I had fifty-eight grains of sediment, which was partly white, and partly dark-coloured, of a salt and bitterish taste, with a sulphureous flavour very nearly resembling *Sal polychrest*.

The same sediment had nothing urinous in the taste, nor raised any pungent vapor, when rubbed with *Sal Ammoniac*, altho' it soon turned of a bright green with Syrup of Violets.

On the red hot iron, it sparkled and flamed, and smell'd strongly of Sulphur.

From the same *residuum* boiled in distilled water,

and exhaled to dryness, I had of Salt nine grains, and of indissoluble matter, two grains: The solution of the Salt was intensely and nauseously bitter, whitened and grumified with Oil of Tartar *per deliquium*, and exhaled to dryness, became of the colour of brown Sugar-candy, of a nauseous bitter taste, like *Sal polychrest*: It moistened in the air, melted and blubber'd a little on the red hot iron, excited an ebullition and acid fume with Oil of Vitriol, but not with Spirit of Salt.

It turned a little green with Syrup of Violets, and boiled in the proportion of half a dram to half a pint of Milk curdled it with a clear whey: most of these appearances quadrate exactly to calcarious Nitre.

The indissoluble matter left in the filtre, was of a white brownish colour, made a great ebullition with Spirit of Salt, and sparkled greatly and stunk on the red hot iron.

Corol. It seems to me the strongest of the *Irish* sulphureous waters, its sulphur partly volatile, and partly fixed. It has also a larger proportion of calcarious Nitre, than either of the two preceding waters, a little absorbent Earth, and a little marine Salt.

As to the Operation and Use of this water in medicine, it has hitherto been but rarely prescribed, except sometimes in Scorbutic disorders, and in some cases of Colic pains, and with such success, as may sufficiently warrant its use in cases wherein other sulphureous waters alike impregnated have been prescribed.

Its Operation is various according to the disposition of the subject, *v. g.* it frequently purges a little, yet some it works by urine only, and others by vomit.

It may be taken to two quarts in a day, and does not load the stomach, but soon passes off, and creates a good appetite.

In some disorders of the Skin wherein it was prescribed, it was observed, in common with several other Sulphureous

Sulphureous and Chalybeate waters, to throw out the pustules in greater abundance.

Fielding Wallis, Minister of the parish, gave me the following history of its remarkable efficacy in a stubborn Dysentery, viz.

“ When the Flux raged terribly in this country, and carried off great numbers of people, a young lad in the neighbourhood, who had laboured under this distemper near a whole year, and was reduced to the last extremity, was by a constant use of this water in a little time perfectly recovered.” (a)

So much more happy was the use of this water, than the common premature administration of astringents locking up the acrimonious humors, without correcting or expelling them, whereas this water by its diluting, mildly deterfive and balsamic quality, is adapted to correct and expel the humors, cleanse and heal the excoriations and ulcerations of the bowels ordinarily attending in such cases.

CLASS III. SECT. I.

Of the SULPHUREO CHALYBEATE
Waters in the County of Cork

THE *Sulphureo Chalybeate* waters are the next, and only remaining sub-division of the sulphureous waters that has yet occurred to my notice in my enquiries into the mineral waters of *Ireland*. I have elsewhere observed, that there is probably scarce any Chalybeate water wholly void of a mixture of Sulphur, tho’ most frequently in so small a proportion as to be scarce worth considering, and accordingly such are called meerly Chalybeate waters ; but I here consider such as have Sulphur combined with their iron in so large a proportion, that the first is equal to or superior to the last, and consequently wherein the Sulphur is entitu-

F f 4

led

(a) See a like Instance in the water of *Swadlingbar*.

led to a considerable share in the medicinal effects. Dr. *Short* in his ample enquiries into the mineral waters of *England*, enumerates and describes a few of these waters, of which I am now to shew, that *Ireland* is not destitute, but perhaps on further search may be found to afford an equal number.

In consequence of the enquiries set on foot by the *Physico Historical Society* in *Dublin*, we have in *Smith's natural and civil History of the county of Cork*, a short account of two or three springs of this sort, which well deserve further examination, viz. two wells midway between *Castle-Townshend* and *Skibbereen*, one of which is strongly Chalybeate, and likewise impregnated with Sulphur; for its water struck a deep claret-colour with Galls, and tinged Silver of a blackish colour in twenty-four hours, and betrayed its sulphureous quality, both to the smell and taste: The other had a strong smack of Sulphur, but struck very little with Galls, tho' it equally tinged Silver. The quantity of solid Contents exhibited by evaporation from either of these, is but very small, and therefore whatever Virtues may be peculiar to them must be deduced from the Sulphur and Iron.

The second or third of this sort of springs mentioned by the same Author, is on the land of *Ballynphelick* near *Five-mile-bridge*, midway between *Cork* and *Kingsale*, which also betrayed its Iron by exhibiting a dark purple colour with astringents, and its Sulphur, by its fetid smell, and tinging Silver immersed in it forty-eight hours of a leaden and copper-coloured hue; and in the neighboured, is a black Coal-slate, some of which is filled with a marcasite, which being burnt manifests both Sulphur and Iron.

No account is given us of the Virtues of these waters, except of one of them having been drank with success in Scorbutic complaints, tho' I doubt not but upon trial, they would manifest the same Virtues as other waters alike impregnated, particularly, that of
the

the following Section, which, being situated where there is a greater resort of people, has recommended it self to more notice, in divers trials that have been made of its good effects; and as it fell under my immediate examination *A. D. 1742.* by means of the friendship of that zealous and indefatigable promoter of good works, *Dr. Henry Maule*, then Bishop of *Dromore*, I shall here subjoyn a minute account of it.

S E C T. II.

BALLYNAHINCH Water

THE spring is on the estate of *Sir John Rawdon*, Baron *Rawdon*, in the parish of *Macbradrol*, alias *Ballynahinch*, about a mile and a half S. W. of the town of *Ballynahinch*, at the skirt of *Slive Croob* mountain, in the diocese of *Dromore*, and county of *Down*, in a good country, and well accommodated with provisions and lodgings. (a)

It is a very clear water, and withal very cold, as *Dr. Short* observes several of the sulphureous waters in *England* to be. It is of a highly disagreeable smell and taste, like water that has been used in scouring a foul gun.

Two specimens of it carefully bottled, were transmitted to me in *Dublin*, one in *June 1742.* another in the same month *1744.* one of these was opened eight days after it had been bottled, and another ten days after: both had the smell above described, with the flavour of boiled eggs proper to the sulphureous waters, but the smell was much weaker than at the fountain, and weaker than in our *Swadlingbar* water in like manner transported.

And some of this water exposed in a glass all night had entirely lost its sulphureous smell.

To

(a) Half a mile from this spring there is another of the same sort.

To these experiments quadrate well those with the metals and their solutions made at the fountain, and on the specimens transmitted as above to *Dublin*, viz.

A Silver six pence immersed about the space of twelve minutes in the water at the fountain, acquired a leaden, blue and copper-colour; but in one of the specimens above mentioned transmitted to *Dublin*, Silver immersed all night, became only of a dusky brown and yellowish colour, Gold became of a deeper yellow, and copper of a redder colour, but in another of those specimens, Silver was not tinged at all; nor did solution of Silver exhibit any dark-coloured cloud or precipitation, but only a white cloud or a small white grume with either of those specimens, and solution of Sugar of Lead precipitated only white grumes in one specimen, and a small brownish grume in another; nor did solution of *English* Vitriol exhibit any blackness or blueness, as the stronger sulphureous waters, but only a brown colour; from all which, it is evident, that a good deal of the strength of the Sulphur is lost by the carriage.

Next, besides the strong sulphureous quality at the fountain, this water also manifests it self to be a Chalybeate of a considerable degree of strength; for it not only struck a purple with Galls, and a blue with Logwood at the fountain, but the specimens transmitted to *Dublin*, retained the ferruginous taste, and one of them struck the same colours with Galls and Logwood, even eight days after bottling.

Exclusive of the Sulphur and Iron, it appears to be a comparatively pure water, for it lathered smooth with Soap, and continued clear with Oil of Tartar and Spirit of *Sal Ammoniac*, the Hydrometre stood in it at the same height as in distilled water, and it made but a very small ebullition with Acids.

The Analysis.

1. *Natural.* In a bottle which had been filled three weeks

weeks, there was a flakey sediment, being the Sulphureo-bituminous matter precipitated, as in several other sulphureous waters; it throws up a yellowish Scum of a very considerable thickness, an argument of the strength of the sulphureous impregnation, and that as the Sulphur is a light body, the water in its natural state contains a much greater quantity than is left upon evaporation, which undoubtedly carries off a good deal of the Sulphur.

2. *Artificial*. A gallon exhaled, as usual, by a mild heat, in a glazed pan, gave only thirteen grains of sediment, which was of a brown yellowish colour, of a brackish and bitter taste, made an ebullition with Oil of Vitriol and Spirit of Salt: it turned green with Syrup of Violets, but did not excite any urinous or pungent smell, when rubbed with *Sal Ammoniac*, and so here is not the alkaline, but rather the calcarious Nitre. It grew damp in the air. It sparkled much, stunk and burnt black on the red hot iron.

Corol. *Ballynahinch* water is a Sulphureo-Chalybeate of considerable strength, especially at the fountain; for it does not bear carriage without great diminution of the sulphureous quality. It yields less fixed Contents, than most of the sulphureous waters above examined.

The combination of the Iron with the Sulphur, is undoubtedly an improvement of it, as a medicine. According to Dr. *Short* the *Sulphureo-Chalybeate* waters in general are very good in a viscosity of the juices with a laxness of the vessels, *Leuco pblegmata*, Dropsy or white Swellings; to which let me add, that whereas *Henricus Ab-beers* assures us, that the *German Spa* waters frequently cleanse and heal Ulcers in the sphincter of the bladder, and that they are a present remedy in a Fistula, from an ill cured Abscess in the *Perinaeum*, and it appears from observation, that the sulphureous waters alone, are also endued with a like Virtue; if then

then the meerly Chalybeate, or meerly sulphureous waters are very good remedies in cases of this nature, will not the combination of them both together in one water, prove still more effectual? I recommend this to trial, and in the mean time Chance has supplied the following account of the Operation and Virtues of *Ballynabinch* water, agreeable to those of other sulphureous waters, *viz.*

The neighbouring people constantly make use of it for bathing in what they call the Scurvy.

It is drank from three pints to three quarts; the chief Operation is by urine, some it vomits (a frequent effect of other sulphureous waters) and it is said to have purged others, but this last effect seems to have been meerly accidental, as the quantity of the Salts it contains is inconsiderable: It does not chill the stomach, like common water, when drank in large quantities, tho' it occasions sulphureous belches.

A Dissenting Minister was overrun with eruptions on the Skin like a Leprosy, and withal had such contractions in his fingers and hands, that tho' he travelled to this well on horse-back, he could scarcely hold his bridle, nor was able to feed himself. Upon a month's drinking and bathing in this water he returned home supple, and with a clean Skin.

There are several instances of the happy success of the use of this water in other cases of the like nature; and there used to be a yearly resort to it of persons in the Itch and in Leprous disorders; and I am told, it has freed several of scorbutic pains in the head, eyes and limbs.

The following is an instance of the healing virtue of this water, and withal of the necessity of subjecting it to a rational administration, *viz.* a child in a scrophulous disorder, attended also with a Scald-head, drank this water, and washed the head with it, which thereupon dried up: she was judiciously advised not to trust in the present disappearance of the external disorder,

order, but to continue to drink the waters in order to sweeten the juices, and secure from a relapse, which being neglected, she died some months after: one strong instance among many others, of the necessity of joining the use of internals to externals, and having a due regard to proper evacuations and other helps cognizable to the sagacious physician.

Scholium. The combination of Iron and Sulphur, does not necessarily produce actual Heat or Warmth in a water, since tho' this combination obtains here, and this water gives marks of a stronger impregnation with Sulphur and Iron than the *Bath-waters* in *Somersetshire*, yet is so far from acquiring any Heat thereby, that it is remarkably colder than many other springs.

S E C T. III.

CASTLEMAIGN Water

D E S C R I B E D in *Charles Smith's natural and civil History* of the county of *Kerry* belongs also to this Class, whose account of it I shall therefore here subjoyn, together with some experiments and observations of my own upon it, *viz.*

It is situated on the lands of *Farnass* in the parish of *Kilgarilander*, a mile and half N. W. of *Castlemaign*.

On the spot it hath a strong sulphureous smell like the scourings of a gun-barrel, which it also retained when brought from the fountain to *Tralee*, about two hours after being taken up, but it did not discolour Silver immersed therein twenty-four hours, and a specimen of it examined in *Dublin* six weeks after bottling, had entirely lost the sulphureous smell.

On the spot it strikes a deep claret-colour with Galls, and a light-blue with Logwood, and the roots of the

Iris

Iris palustris; and it keeps clear, without letting fall its Ochre several days after it has been taken up.

Examined in *Dublin* six weeks after being bottled, it was exquisitely clear and void of all sediment, had some little musty smell, but a strong ferruginous taste, and turned purple with Galls, holding the tincture for a whole week: It was blue with Logwood, and had blackened the Corks extremely.

Silver immersed in it suffered no change of colour: The solution of Silver turned it pearl-coloured, with a small white grume. The solution of Sugar of Lead gave a slight pearl-colour: The solution of Copperas turned it greenish with a yellow sediment.

It lathered presently with Soap, and by the Hydrometre appeared to be a little lighter than distilled water.

The Analysis.

It yielded nearly the proportion of eleven grains of sediment from a gallon, which was ochre-coloured, and of a brackish taste, was a little attracted by the Magnet, without previous calcination, smell'd fetid, and somewhat pungent when rubbed with *Sal Ammoniac*, smell'd greasy, and somewhat pungent rubbed with Salt of Tartar, sparkled, flamed and smell'd strong on the red hot iron.

Corol. It is strongly impregnated with Iron, and a little with Sulphur, but the last is soon lost, and so it does not bear carriage to remote places, so that to reap the benefit of the union of these two minerals, it would be necessary to drink the water at the fountain.

It much resembles the *Drigwell* in *Cumberland* described in my *General History*, which is produced of Iron-stone and Sulphur marcasites, and whose Sulphur is also lost in a few hours, but the Chalybeate principle keeps longer.

It

It hath as yet been but little used, and therefore its Virtues must be left to further observation : in the mean time, it will not be useless to observe, that it sits easy on the stomach, and has not been known to prove emetic to any ; that it is extremely diuretic, and in a large dose purgative ; that a woman who drank it in 1751. for a Rheumatism, found much benefit by it : a second was relieved by it in a Paralytic case ; and a third drank it the same season for a confirmed Obstruction in his Liver, who received benefit at first, but some time after grew worse, and died of his disorder.

AN APPENDIX

To the SULPHUREOUS WATERS,

Exhibiting some other Waters, which for want of more Experiments, cannot at present be reduced to their proper Places under the foregoing Classes.

BESIDES the numerous sulphureous springs, with which the northern parts of this kingdom abound, whose Histories I have above minutely given, it is highly probable, that a more accurate search would discover yet many more, a search not to be condemned as a piece of idle curiosity, since it might furnish us with a yet more compleat History of these salutiferous springs, and give us a more just idea of their distinct nature, contents, operation and virtues.

Foreigners have as yet been very scanty in their accounts of these waters, and for those of *England* the world is chiefly indebted to Dr. *Short*, tho' it appears, that this kingdom is not less conspicuous for the number and variety of these waters, which appear by observation to be possessed of great Virtues, some of which have not been authentically recommended to the notice of the public until of late.

The

The supply of the deficiency of the experiments, therefore necessary to be made on the following imperfectly examined waters, as well as the investigation and examination of others is recommended to such physicians as may live in their neighbourhood : in the mean time the following hints may not be useless.

1. I am informed, that besides the sulphureous water of *Agbaloo* in the county of *Tyrone* above described, there was in the same county, twenty-seven miles from thence, another spring, which, to outward appearance, was of the same kind, and used for bathing in the Itch, which is now dried up ;

And that on the mountains in or near the county of *Leitrim*, are several sulphureous springs, far stronger than that of *Swadlingbar*, particularly that

2. At *Meelock*, on the middle of a mountain between *Drumasnave* and *Fenaugh*, in the county of *Leitrim*, is a water much stronger than the last mentioned, and that it tinges Silver black. This water is taken notice of by the by in the Section on the *Swadlingbar* water, a Leprous patient there mentioned, having travelled hither from *Swadlingbar*, in order to confirm his signal cure with the desired effect : he staid here a month, and drank four quarts of the water in a day, and observed it to move him by stool, more than the *Swadlingbar* water had done : And

3. At *Athimonus*, half a quarter of a mile from the former, is another spring of the same kind.

4. In a Farm called *Agbnabinch* a mile South from *Newtown-Butler*, near *Sandboles*, and very near the road, is a spring of this sort, which indeed is badly situated, viz. in a low, flat, swampy ground, and liable to be adulterated by rain water, and by a neighbouring Lough. However, *Samuel Molyneux Madden*, Esq; went to the spot, and examined it,
and

and September 6, 1746. gave me the following account of it.

“ The well being emptied, and cleared of the dirt, two or three veins appeared, which evidently flowed from the well. The smell of the water was like that wherewith a gun has been several times washed after much shooting, its taste very disagreeable, and more so than that of *Swadlingbar*, and in four or five seconds, it changed Silver of a muddy yellow cast.”

I have had no opportunity of searching the bowels of the earth, in the neighbourhood of this and other sulphureous springs in this work for the Fossils, some account of which might have tended considerably to the illustration of their Histories; in lieu of which, I shall here subjoin, in the words of my curious and faithful Correspondent, *James Leonard*, frequently mentioned above, an account of a remarkable *Phenomenon*, which lately happened in the neighbourhood of the last mentioned, and several other of the sulphureous springs, as shewing, that the earth hereaways is not destitute of a fund of that *Sulphureo-bituminous* matter, which I have traced as the principal ingredient in these waters.

“ There happened a strange thing lately, viz. there is a mountain-Lough two miles from *Lisnaskea*, named *Lough-Lea*, which is about a mile in compass, having a gravelly shore all round, except one side, which is a turfy-bank, which bank about the middle of *October* last sunk down to near the level of the water, and in a few days the whole Lough became covered with a whitish green slimy Scum (a) of above

G g

two

(a) Compare the observations on the Scum of the sulphureous water of *Meaban* Sect. VI. Class I. above. The Scum here described by its whitish green colour, its slimey texture and lightness, whence it swims on the water, and by the Fetor it acquires by being kept, seems to agree to the *Sulphureo bituminous* matter, which impregnates the sulphureous waters, and which upon their slow motion secedes to the surface,

two inches deep, which coloured the stones in a small river, which runs from the said Lough, and was visible for above two miles along the river."

"A curious person took up a bottle full of this water and scum, which was shewn to me about eight days ago: it was thick, of a darkish colour and fetid smell."

"I am told that this Lough abounds with fine Trouts, and that the water was not stinking when taken up, but that it putrified by keeping."

"At a week's end, the Lough cleared again, and it is said afterwards to have changed, and exhibited the like Scum as above described; and I am of opinion, that this Lough has had such changes in former times, from whence perhaps it has been named *Lough Lea*, which in *Irish* signifies the *grey Lough*."

Your humble Servant,

JAMES LEONARD.

Lisnaskea, November

30, 1753.

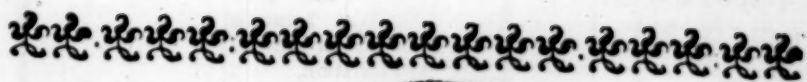
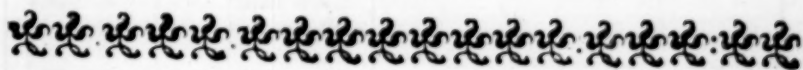


TABLE IX.

WITH

OBSERVATIONS, &c.



T A B L E IX.

Summarily in one View the principal Appearances afforded above, together with some of the foreign ones.

	Sensible qualities.	Specific Gravity.	Silver and its Solution.	Other Metals and their Solutions.
<i>Aix la Chapelle baths.</i>	Some inodorous, others strongly sulphureous, and like the washings of a foul gun.		Silver of a gold colour, and by a longer stay red purplish, and then blackish. Solution milky; or grey at the fountain.	Little change with the solution of Sal Martis.
<i>Moffat.</i>	Smell like a foul gun: milky, bluish.	As 838 to 840 compared to a neighbouring spring	Turns Silver of a copper-colour. A blackish sediment with the solution.	Brightens the solution of gold.
<i>Swadling-bar.</i>	Limpid, sometimes wheyish: smell like a foul gun; flavour of a boiled egg.	Equal to that of the neighbouring brook	Silver of a leaden and copper-colour. its solution a dark brown sediment.	Gold of a deeper yellow, copper of a deeper red. Blackened with the solution of copperas; iron was blackened.
<i>Derrylester</i>	Bluish, viewed from above: fetid, flavour of roasted eggs.	Lighter than distilled water.	Silver of a leaden and copper-colour. A brown sediment with the solution.	The colour of gold heightened. Copper redder. Black with solution of copperas.
<i>Lisbleak, 1st spring.</i>	A fetid smell.	Equal to that of distill'd water.	Silver of a copper-colour & black; a brown yellowish sediment with the solution.	Black with solution of copperas.
<i>Killashber 3d spring.</i>	Strongly fetid.		Silver of a copper, leaden, and black colour. A dusky yellow sediment with the solution.	Black with solution of copperas
<i>Mechan spring.</i>	Very fetid: flavour of a boiled egg.		Silver gold-coloured, black and copper coloured. A brown grumous sediment with the solution.	Black with solution of copperas.
<i>Asbwood.</i>	Fetid, and the flavour of a boiled egg.		Silver yellow, copper-coloured, & black. A small brown, yellowish sediment with the solution.	Blackish, clear with solution of copperas.

Exhibiting

by the chief of the Sulphureous Waters minutely described

Soap and Alcalies.	Acids.	Galls	Quant. of Contents in a gallon	Quality of Contents.	Operation.
Milky with solution of salt of tartar.	Some ebullition.	Milky.	Gr. 240.	Earth, sulphur, natron, and marine salt.	Diuretic, purgative, absorbent, deobstruent, drying, attenuating, softening, corroborating, cleansing & healing
Whitish with oil of tartar.	Milky with oil of vitriol, and spirit of nitre.		Gr. 55 or 68.	Sulphur & marine salt.	Diuretic, laxative, healing.
Soon lathered with soap. A very minute cloud and precipitation with alcalies.	A minute ebullition and yellowish sediment, or white cloud.	No considerable change.	Gr. 43.	Sulphur & natron.	Diuretic, diaphoretic, sometimes laxative, emmenagogue sweetening, cleansing and healing.
Clear with alcalies.	A minute ebullition.	Little or no tincture.	Gr. 31.	Sulphur & natron.	
A smooth lather with soap. Clear with solution of salt of tartar.	An ebullition with oil of vitriol.	Wheyish.	Gr. 36.	Sulphur & natron very pure.	
A little curd with soap; a small white cloud with alcalies.	A minute ebullition and a white cloud.	A little wheyish.	Gr. 38.	Sulphur & natron.	
Lathered with soap: clear with solution of salt of tartar.	A considerable ebullition with oil of vitriol.		Gr. 21.	Sulphur & natron.	
Soon lathered with soap: clear with solution of salt of tartar.	A little ebullition with oil of vitriol.	Little tincture.	Gr. 28.	Sulphur & natron.	

T A B L E IX.

Exhibiting summarily in one View the principal Appearances
scribed above, together with some of the foreign ones.

	Sensible qualities.	Specifick Gravity.	Silver and its Solution.	Other Metals and their So- lutions.
<i>Derry- bence.</i>	Very fetid.		Silver of a brown yellowish: a small brown sediment with the solution.	A dark clear with solution of copperas.
<i>Druma- snave.</i>	Clear: white before rain: very fetid, taste as of rotten eggs.	Nearly as that of distilled water.	Silver of a cop- per colour & black. A dark brown sedi- ment with the solu- tion.	Gold of a bright yellow: copper of a lead colour: so- lution of copperas black.
<i>Anaduff.</i>	Bluish, viewed from above: fe- tid, like Lac Sul- phuris, with the flavour of a boil- ed egg.	As that of distilled water.	Silver of a cop- per and brown co- lour: a brown sedi- ment with the solu- tion.	Dun-blackish with solution of copperas.
<i>Agbaioo.</i>	A strong sul- phureous smell, and the boiled- egg-flavour.	Heavier than common wa- ter.	Silver copper-co- loured and black: a dark brown sedi- ment with the so- lution.	
<i>Derrindaff</i>	Fetid, with the boiled-egg-fla- vour and nause- ous bitterness, with an astring- ency.	Nearly as of distilled water.	Silver copper-co- loured and black: a dark brown sedi- ment with the solu- tion.	Gold of a deep- er yellow: copper was blackened: black with solu- tion of copperas.
<i>Spring near Owen Breun.</i>	Fetid with the boiled-egg-fla- vour.		Silver copper-co- loured and black: a brown yellowish sediment with the solution.	Black with the solution of coppe- ras.
<i>Pettigoe.</i>	Smell and fla- vour excessively fetid and nause- ous, like a mix- ture of blimestone and rotten eggs.	Nearly as of distilled water.	Silver of a dark brown and copper- colour: a dark brown sediment with the solution.	Gold was ad- vanced to a red- dish colour: with solution of coppe- ras black.
<i>Ballyna- binch.</i>	Clear, very cold: taste like the washings of a foul gun, with the boiled egg- flavour.	Nearly as of distilled water	Silver of a lead and copper-colour: a small white grume with the solution.	Gold of a deeper yellow, copper of a redder colour: solution of sugar of lead brownish.

Continued.

afforded by the chief of the Sulphureous Waters minutely de-

Soap and Alkalies.	Acids.	Galls.	Quant. of Contents in a gallon	Quality of Contents.	Operation.
Soap curdled a little: solution of salt of tartar whitish.	A small ebullition with oil of vitriol.		Gr. 21.	Sulphur & natron.	
Soon lathers with soap: a little opake with alkalies.	An ebullition.	Wheyish.	Gr. 30.	Sulphur & natron, and a little calcarious nitre and earth.	Diuretic, sweetening, attenuating, deobstruent, cleansing, drying & healing.
Curdles with soap: whitens with solution of salt of tartar.	An ebullition.	Wheyish.	Gr. 27.	Sulphur, natron, and calcarious earth.	
Soon lathered with soap: a very subtile white cloud with solution of pot-ashes.		Wheyish, and the Galls purplish.	Gr. 31 or 35.	Sulphur, natron, and calcarious nitre.	
Curdled a little with soap: a small opacity with alkalies.	Scarce any ebullition.	Wheyish, with a slight blue circle.	Gr. 23.	Sulphur, and calcarious nitre.	
Curdled with soap: a white sediment with solution of salt of tartar.	A considerable ebullition with oil of vitriol.	A bluish circle at the surface.	Gr. 43.	Sulphur, and calcarious nitre.	
Curdled greatly with soap: a large white sediment with oil of tartar	An ebullition with oil of vitriol.	Turbid, wheyish.	Gr. 58.	Sulphur, and calcarious nitre.	Diuretic: frequently purges a little: cleansing, healing.
Lathered smooth with soap: almost clear with oil of tartar.	Very little ebullition.	Purple.	Gr. 13.	Sulphur, and iron.	Diuretic.

OBSERVATIONS

ON THE

TABLES and HISTORIES.

1. **N**OTWITHSTANDING that divers of the Sulphureous waters soon become effete, when carried to a small distance from their fountains, yet generally they bear carriage, and retain their original qualities, as at the fountain, if carefully bottled and corked, much longer and better than the Chalybeate waters, and for this obvious reason, that the Sulphureous waters, are generally saturated with a larger proportion of mineral contents, than the Chalybeate, as by comparing their respective Tables and Histories will appear.

2. The *Natron*, or native alkaline Salt, is of all other Salts the most frequently combined with Sulphur; besides other evidences of the presence of this Salt, one very obvious is, that such waters, even when largely impregnated, do not, unless when mixt with some other Salt, curdle, but lather smooth with Soap, and keep clear with Alcalies, whereas in waters impregnated with an equal quantity of the common calcarious Nitre, a coagulation with Soap and Alcalies always appears.

This *Natron* seems to be an apt *menstruum* for dissolving the Sulphur, and mixing it with water, even as the artificial Alkali is well known to be, and it gives these waters a more powerful sweetening quality with respect to Acids, than most or any other waters.

3. Tho'

3. Tho' the Sulphureous waters frequently prove Emetic at the beginning, perhaps by their nauseousness, they are not purgative *per se*, but as impregnated with Salts, and in proportion to the quantity of Salts combined with the Sulphur, as appears by the respective histories of the *English* and *Irish* Sulphureous waters compared together.

And now having thus far, according to the best of my ability, sketched out a Plan for a natural and medicinal History of the mineral waters of this country, I shall make no apology for the imperfections of the performance, well knowing, that to bring a work of this kind to the necessary degree of perfection, would require not only superior talents to what I can lay claim to, but a *series* of Time and Observation, exceeding the age of any one man, tho' he were devoted to nothing else.

The very few Essays that have been hitherto published on this subject, I have taken notice of in the respective places, but the far greater part of the Waters here described have been the result of my own search and examination, with a view to an improvement of this branch of the *materia medica*, as being worthy of recommendation, not only on account of its efficacy, but pleasantness.

But if any invidious Critic shall attempt to expose the defects or venial errors in this work, he shall not find me at leisure to answer him, who having devoted the best part of my life to the study of this subject, leave and recommend the prosecution thereof to Posterity.

Nevertheless, if any public spirited person, willing to contribute to the improvement of this branch of natural Knowledge, should think proper to communicate any further accounts or animadversions on the mineral waters here treated of, or others in this kingdom not here mentioned, of which I doubt not but many instances may occur, any such accounts shall

shall be gratefully received, duly attended to, and preserved, as long as it shall please God to give life and health, as necessary Corrections or Additions to this first Essay, if ever a second Edition should be required, which I would purpose to print separately for the use of the Subscribers to the first: for indeed, I am far from thinking the subject to be exhausted, having, since the above sheets were printed off, received a signal instance to the contrary, in a Specimen of a Vitriolic Water which I received from a communicative Gentleman of *Beaumaris* in *Wales*, which for the singularity of some of the phænomena by it exhibited, and particularly this, that altho' it had no immediate effect either on the Corks or on Galls, yet, on being exposed a while, it struck one of the most beautiful azures in the world, deserves a more minute account, which may be published at a proper opportunity.

Dublin, 7th of the 7th
Month, 1757.

9 DE 63

A D V E R T I S E M E N T.

THE Author of the foregoing Essay acknowledgeth to have received ten pounds from the *Physico-historical Society* in *Dublin*, in order to enable him to carry on some enquiries into the Natural History of the County of *Dublin*, and at the same time thinks it proper to signify, that he expended more than that sum in carrying on those Enquiries, and therefore, and especially since the branch of natural History which is the subject of the above Treatise, hath engrossed a great deal of his time, he thinks himself under no obligation to hurry on the publication of any intended Specimen of a Natural History of the County of *Dublin*, nor to prosecute the same any otherwise than at his own leisure.

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I N D E X.



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